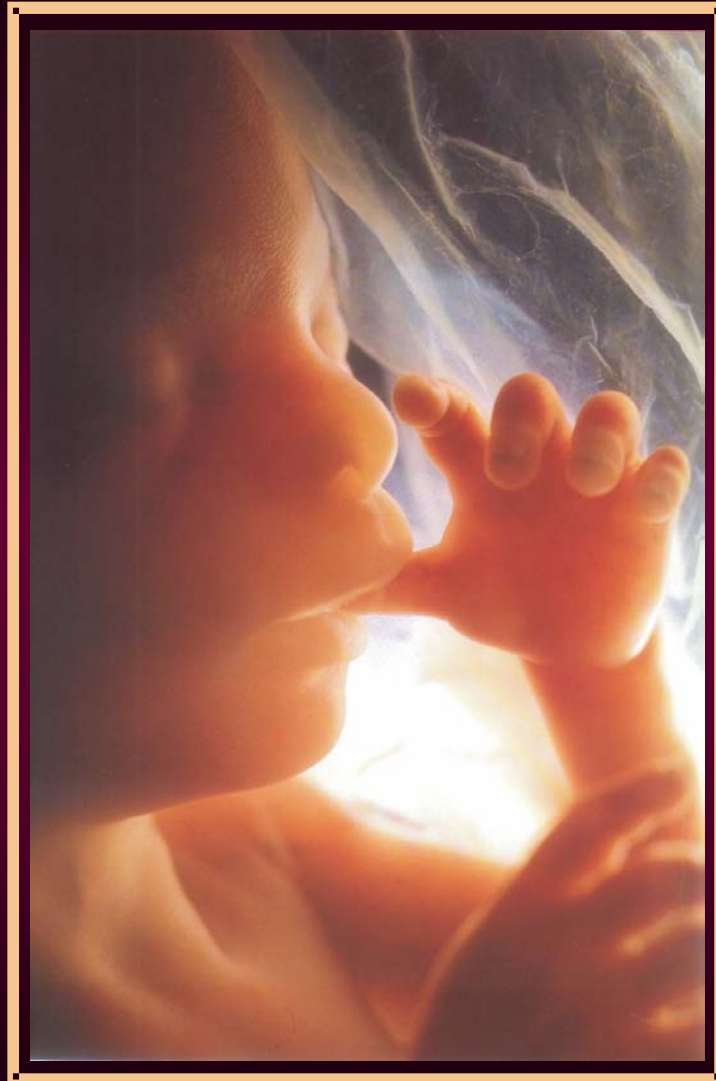
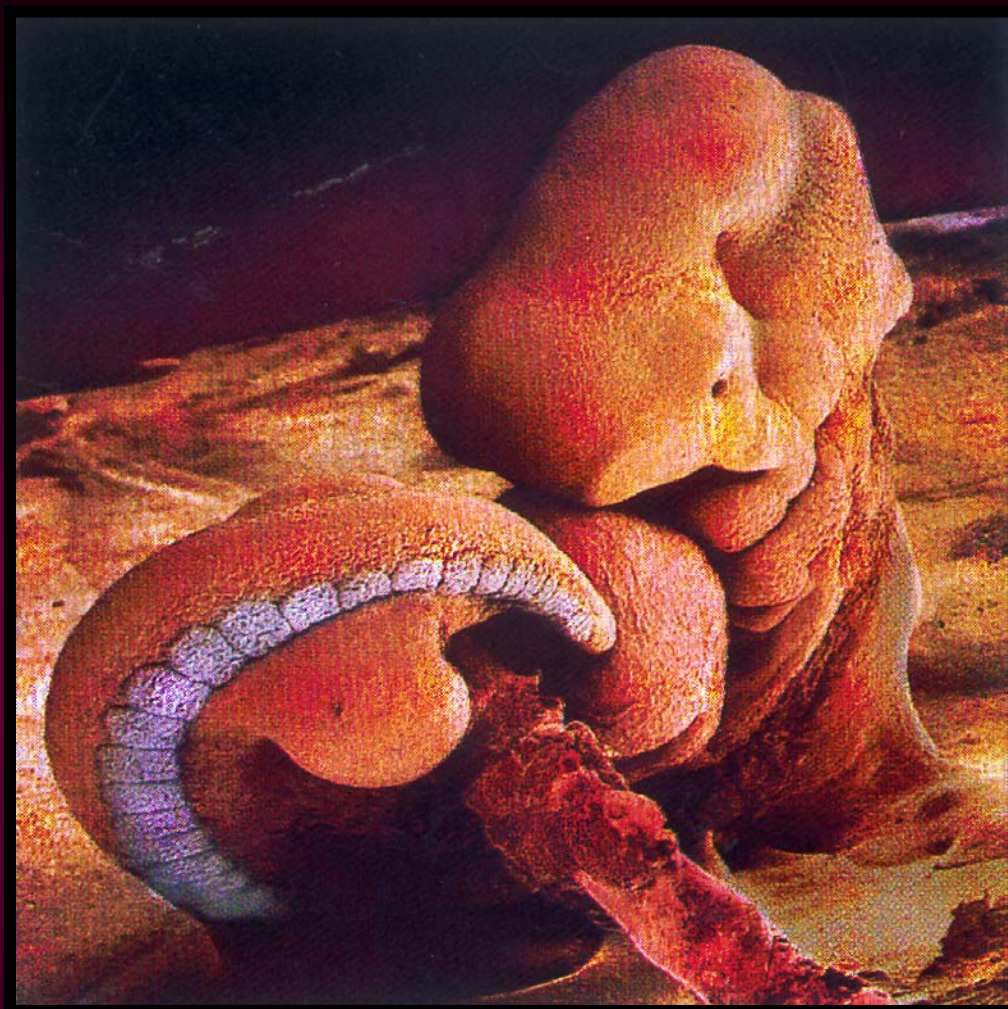


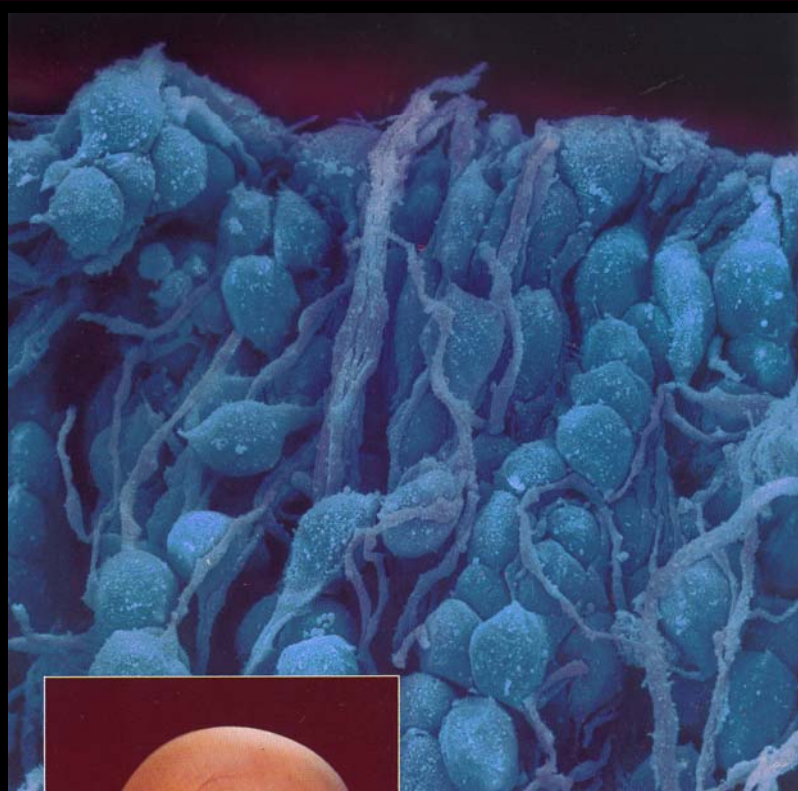
## *Seeing the Pain*

America's physicians confront family violence









#### Early connections in the brain

The brain is undoubtedly one of nature's most remarkable creations: cells that can react to impulses, analyze and control behavior. As early as in the seventh week, nerve cells in the brain have begun to touch one another by means of projections, and some have even become connected in primitive nerve paths. The picture *above* shows nerve cells at this time, greatly enlarged. The rate of production is tremendous: 100,000 new nerve cells are created every minute, and by the time the baby is born, there will be some 100 billion. *Left*, the posterior lobes of the cerebrum shimmer through the skin of the forehead.

5 Days



2 Months



1 Year



28 Years



*RAPID EARLY DEVELOPMENT: These PET scans suggest that the brain of a one year old more closely resembles an adult's brain than a newborn's.*

Source: H.T. Chugani

At Birth



6 Years Old



14 Years Old

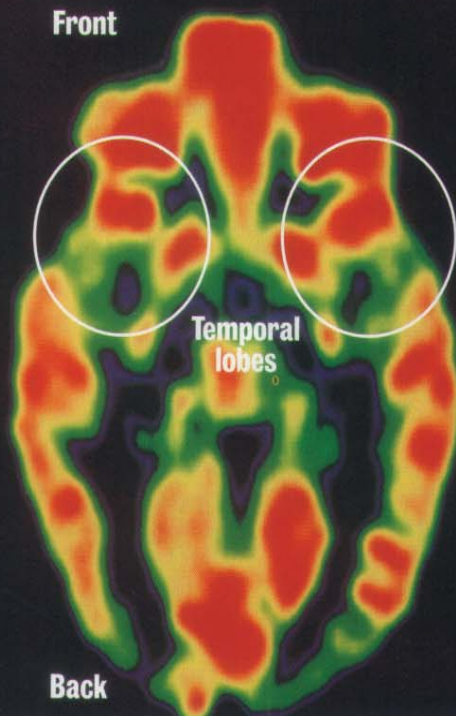


*SYNAPTIC DENSITY: Synapses are created with astonishing speed in the first three years of life. For the rest of the first decade, children's brains have twice as many synapses as adults' brains.*

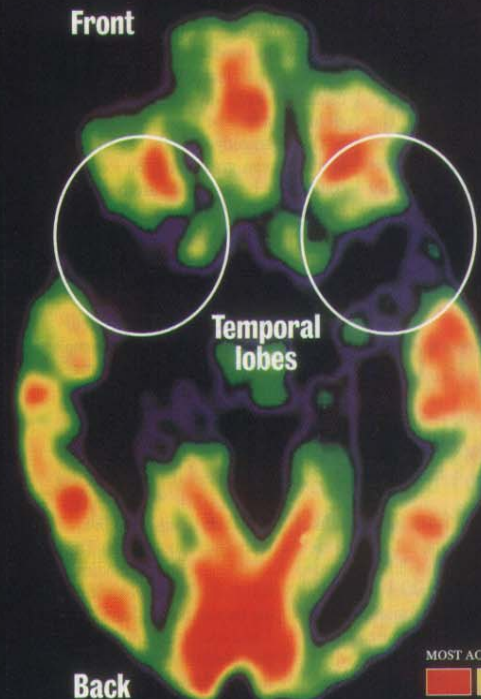
Drawings supplied by H.T. Chugani.

## Healthy Brain

This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.



Front



## An Abused Brain

This PET scan of the brain of a Romanian orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.

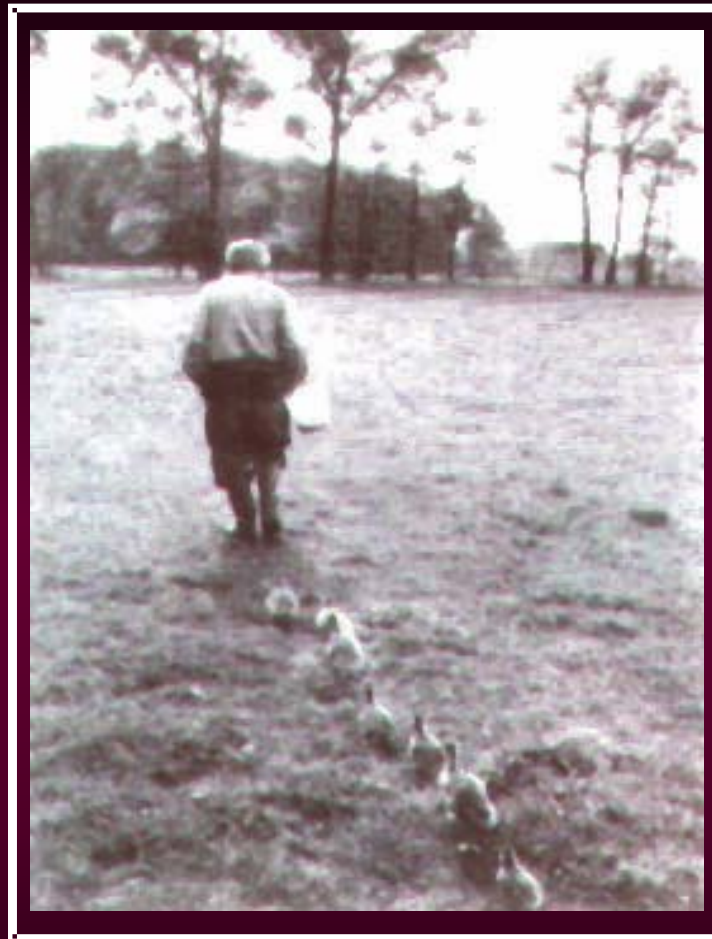
MOST ACTIVE      LEAST ACTIVE

Red	Yellow	Green	Blue	Black
-----	--------	-------	------	-------



**“In other words, early experiences help to determine brain structure, thus shaping the way people learn, think, and behave for the rest of their lives.”**

***I Am Your Child***  
***Reiner Foundation***



## **The Adverse Childhood Experiences (ACE) Study**

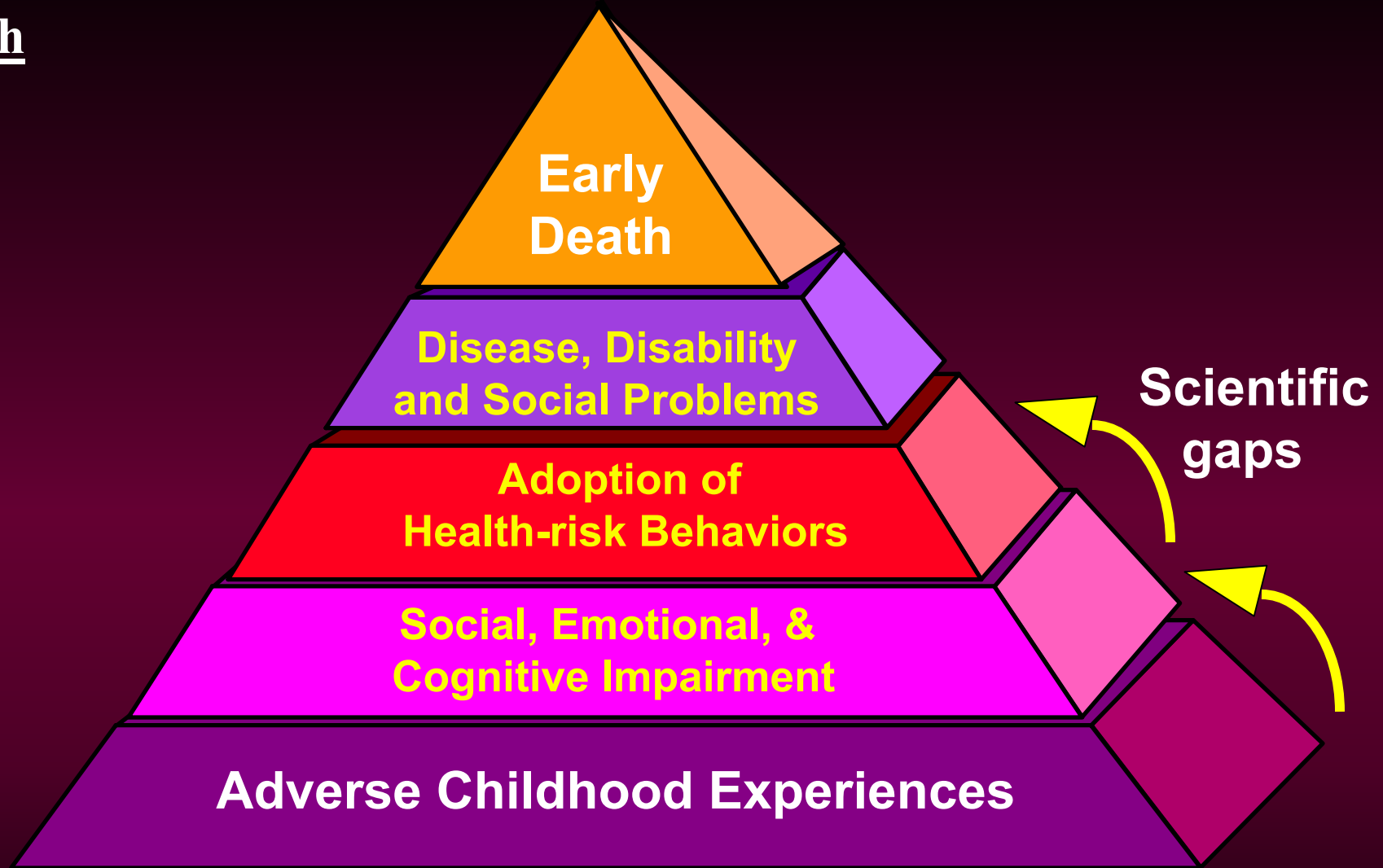
**The largest study of its kind ever done to examine the health and social effects of these childhood experiences throughout the lifespan (17,421 participants)**

### **What do we mean by Adverse Childhood Experiences?**

**Experiences that represent health or social problems of national importance.**

- childhood abuse and neglect**
- growing up with domestic violence, substance abuse or mental illness in the home, parental discord, crime**

Death



**Scientific  
gaps**

**Adverse Childhood Experiences**

**Social, Emotional, &  
Cognitive Impairment**

**Adoption of  
Health-risk Behaviors**

**Disease, Disability  
and Social Problems**

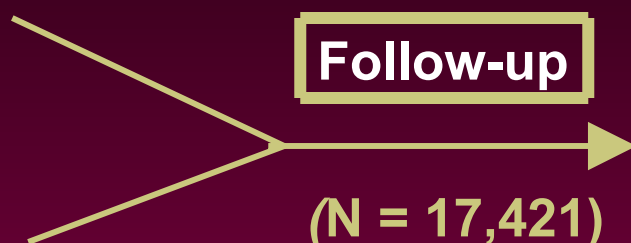
**Early  
Death**

Conception



# ACE Study Design

**Survey Wave I--70% response  
(9,508/13,494)**



**Survey Wave II--65% response  
(8,667/13,330)**

***All medical evaluations  
abstracted from both waves***

**Mortality**

**National Death Index**

**Morbidity**

**Hospital Discharge**

**Outpatient Visits**

**Emergency room  
visits**

**Pharmacy Utilization**

# The Adverse Childhood Experiences (ACE) Study

## Summary of Findings:

- Adverse Childhood Experiences (ACEs) are very common
- ACEs are strong predictors of health behaviors in adolescence and adult life
- This combination of findings makes ACEs one of the leading, if not the leading determinant of the health and social well-being of our nation

# **Adverse Childhood Experiences Are Very Common**

## **Percent reporting types of ACEs:**

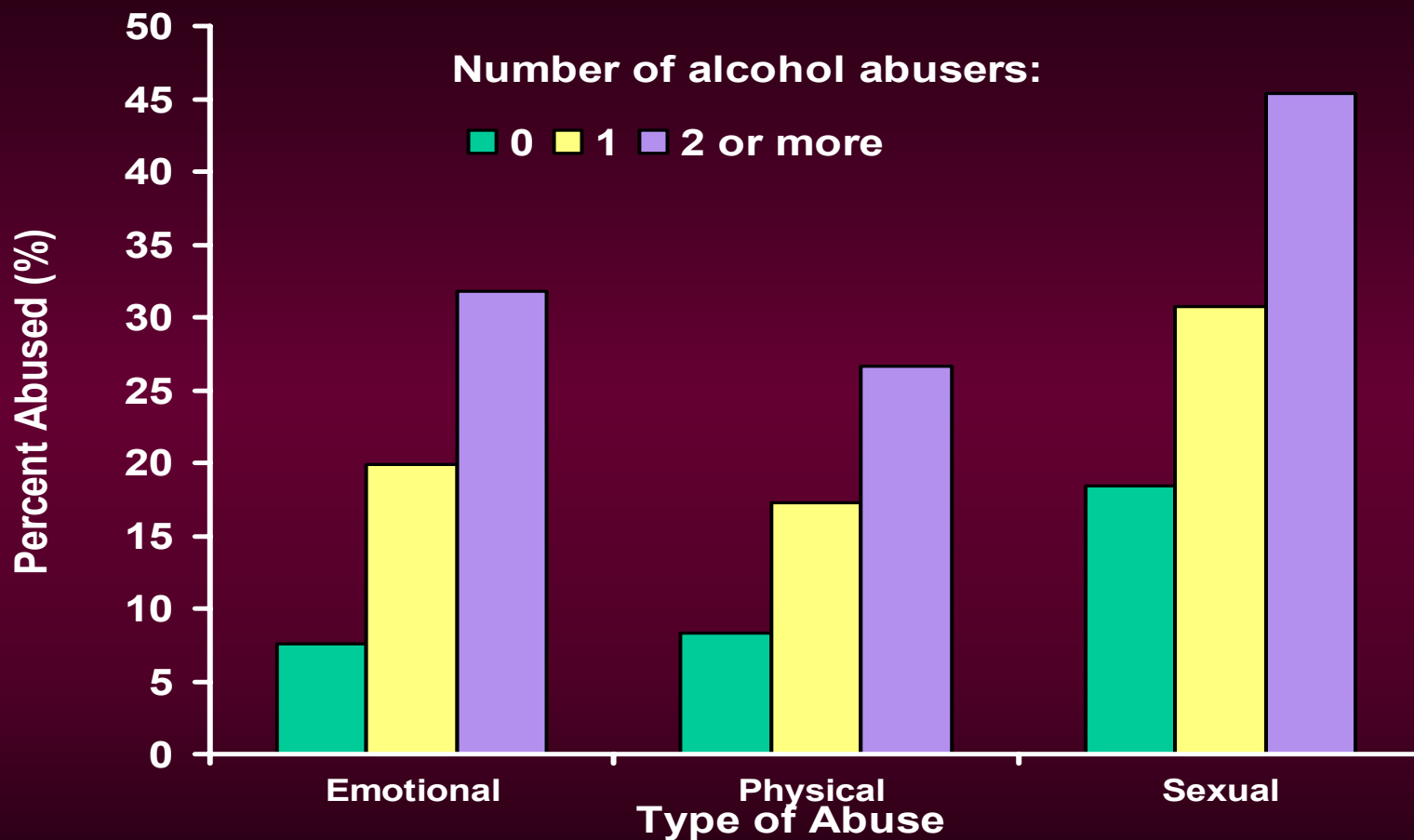
### **Household exposures:**

<b>Alcohol abuse</b>	<b>23.5%</b>
<b>Mental illness</b>	<b>18.8%</b>
<b>Battered mother</b>	<b>12.5%</b>
<b>Drug abuse</b>	<b>4.9%</b>
<b>Criminal behavior</b>	<b>3.4%</b>

### **Childhood Abuse:**

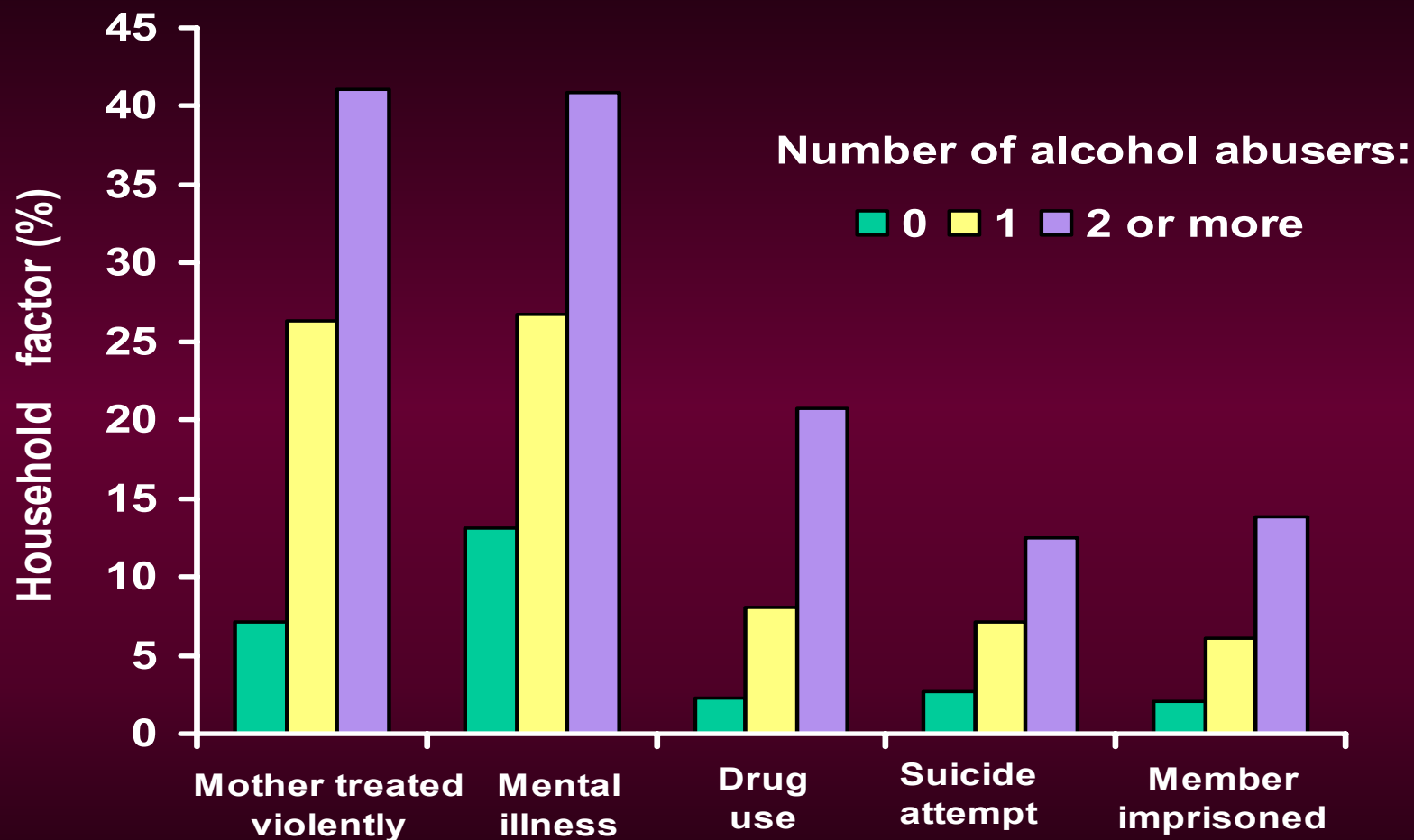
<b>Psychological</b>	<b>11.0%</b>
<b>Physical</b>	<b>30.1%</b>
<b>Sexual</b>	<b>19.9%</b>

# Alcohol Abuse in the Home and the Risk of Childhood Abuse

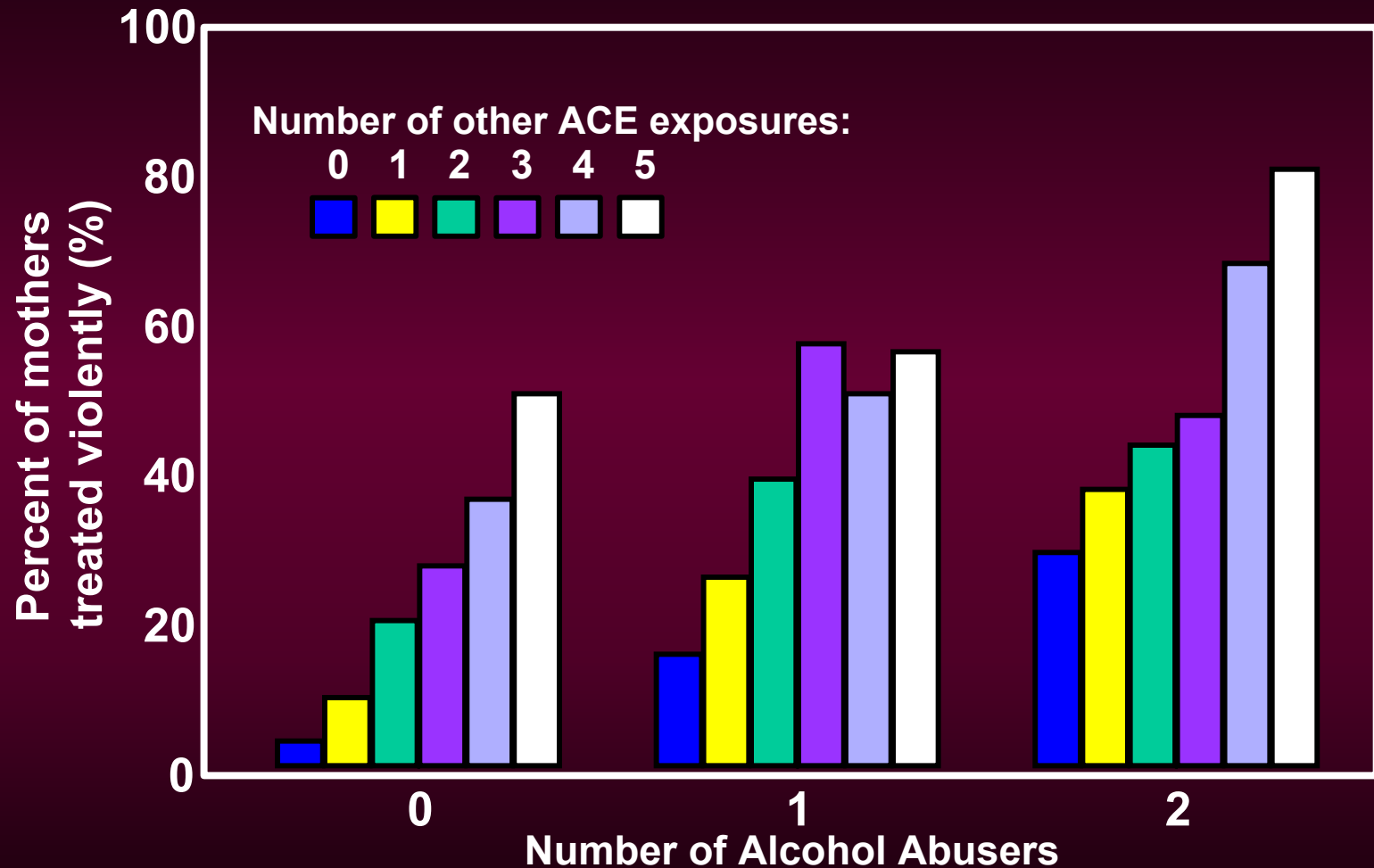




# Alcohol Abuse in the Home and the Risk of Other Household Exposures During Childhood



# A “Fuel Mix”: Alcohol Abuse, Other Adverse Experiences and the Risk of Violence Against Mothers



# **Adverse Childhood Experiences Rarely Occur in Isolation...**

**They come in groups.**

# Adverse Childhood Experiences Score

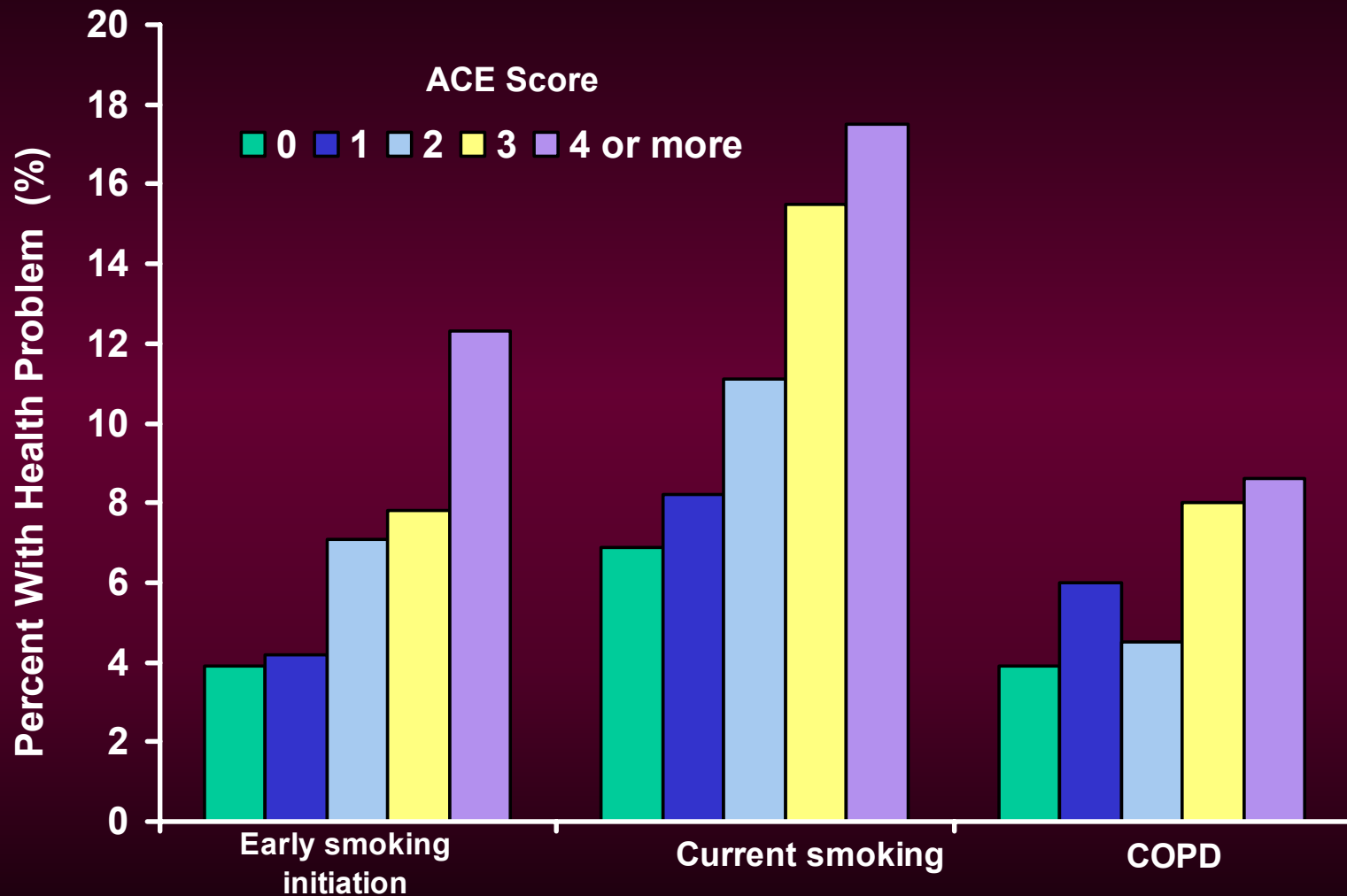
Number of individual adverse childhood experiences were summed...

<u>ACE score</u>	<u>Prevalence</u>
0	47.9%
1	24.9%
2	13.1%
3	7.3%
4 or more	6.8%

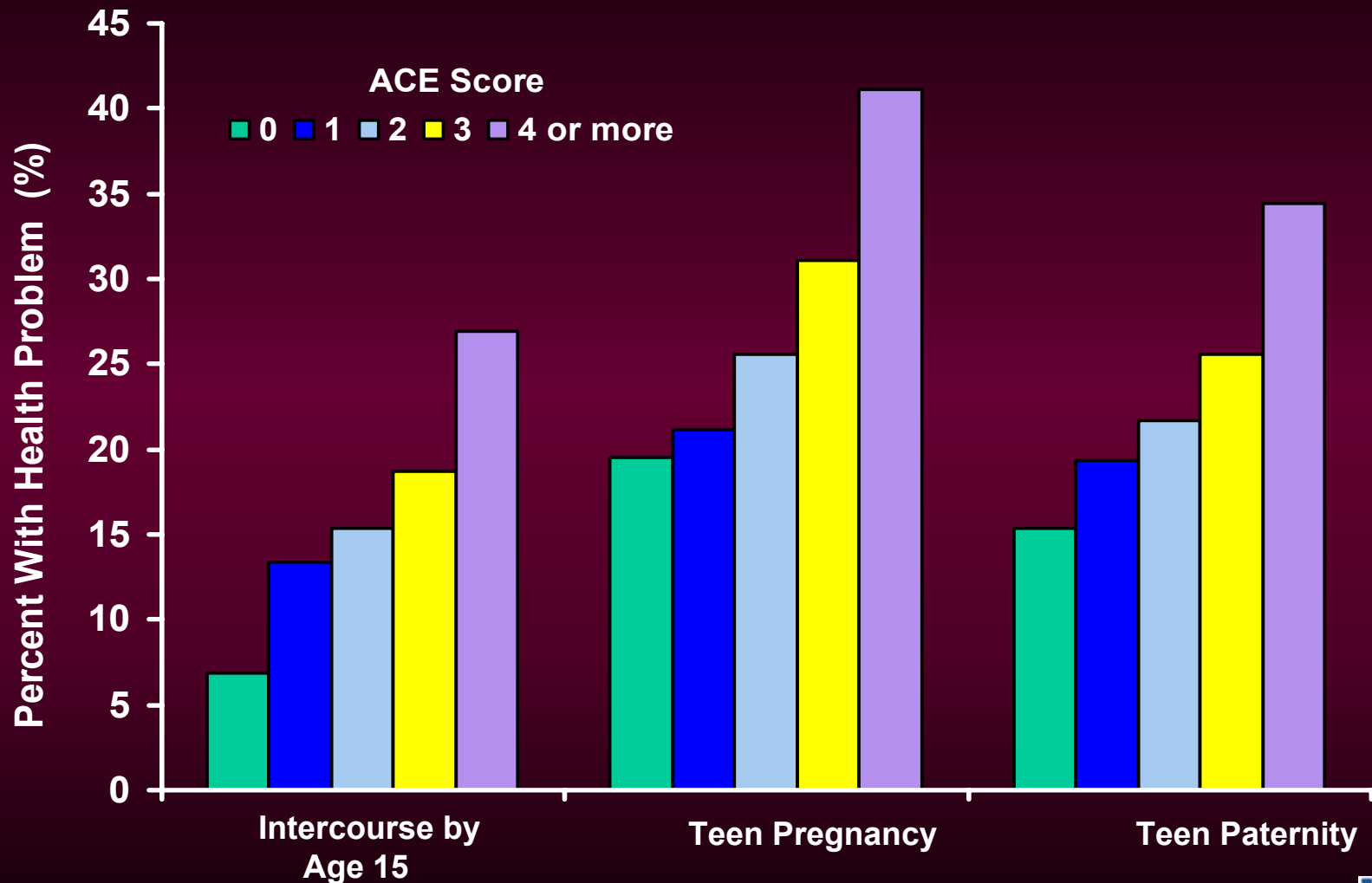
- More than half had at least one ACE
- More than one in four had 2 or more ACEs



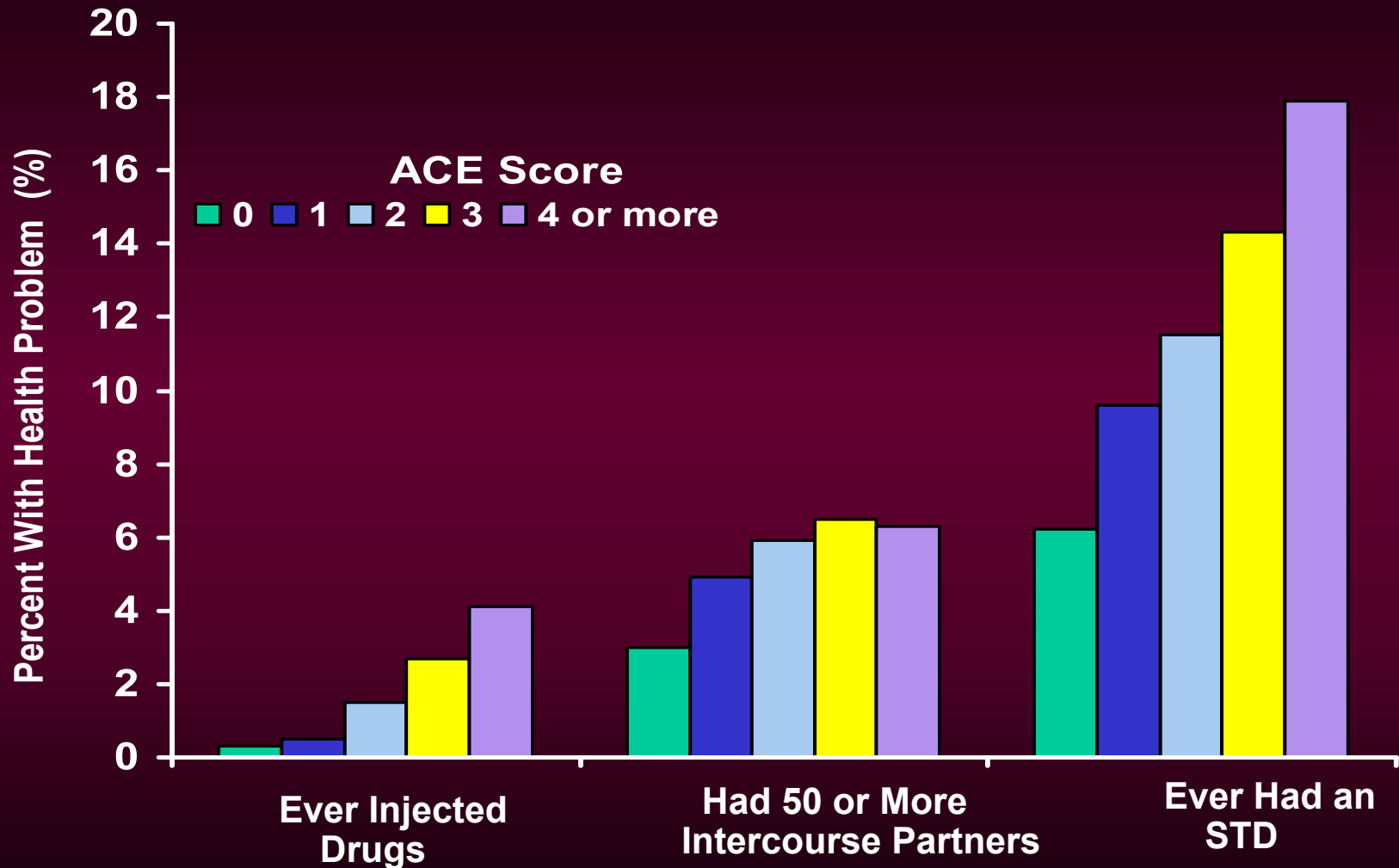
## Relationship Between Number of Adverse Childhood Experiences and Smoking Behaviors and Smoking-Related Lung Disease



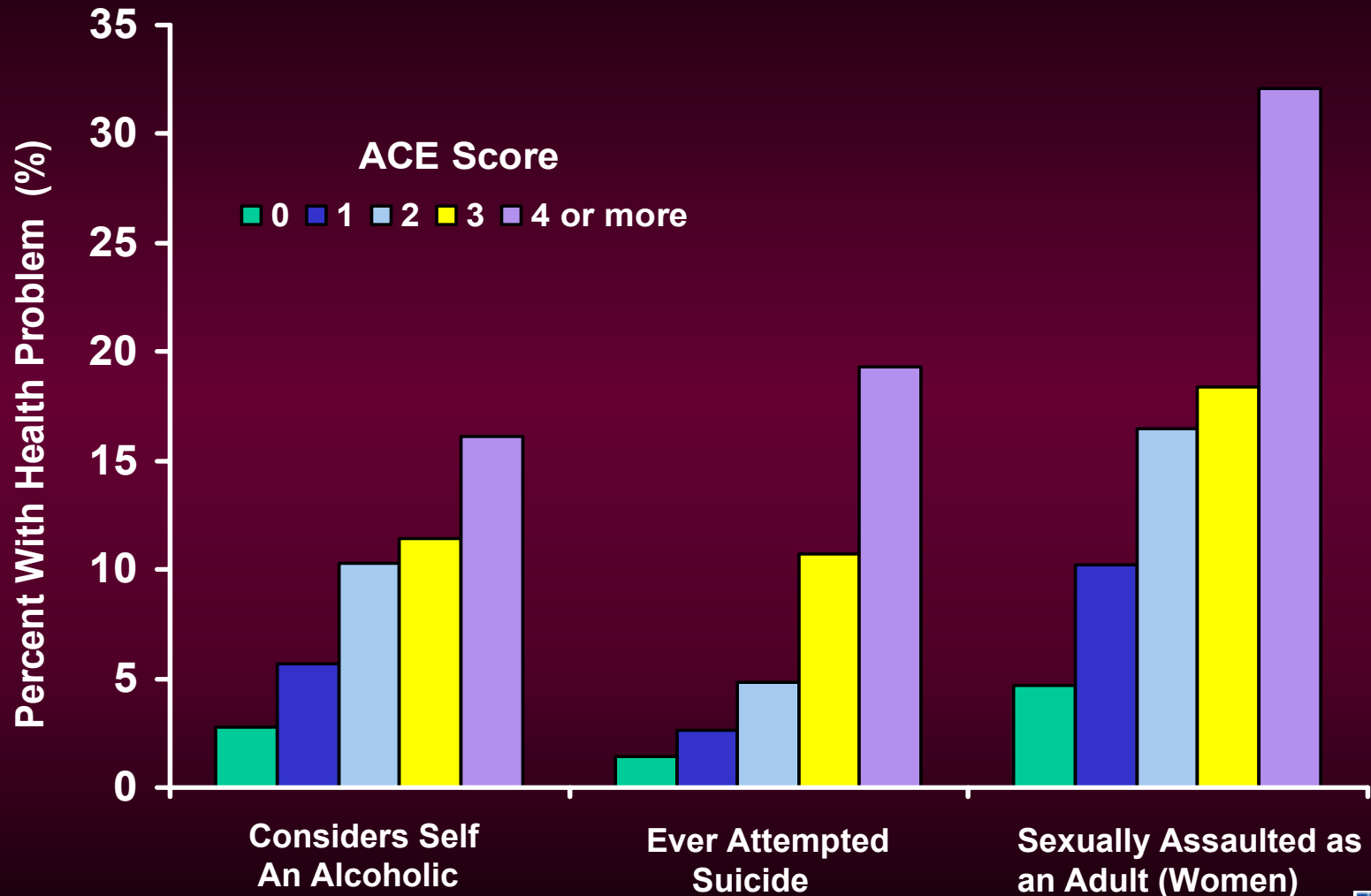
# ACE Score and Teen Sexual Behaviors



# ACE Score and HIV Risks

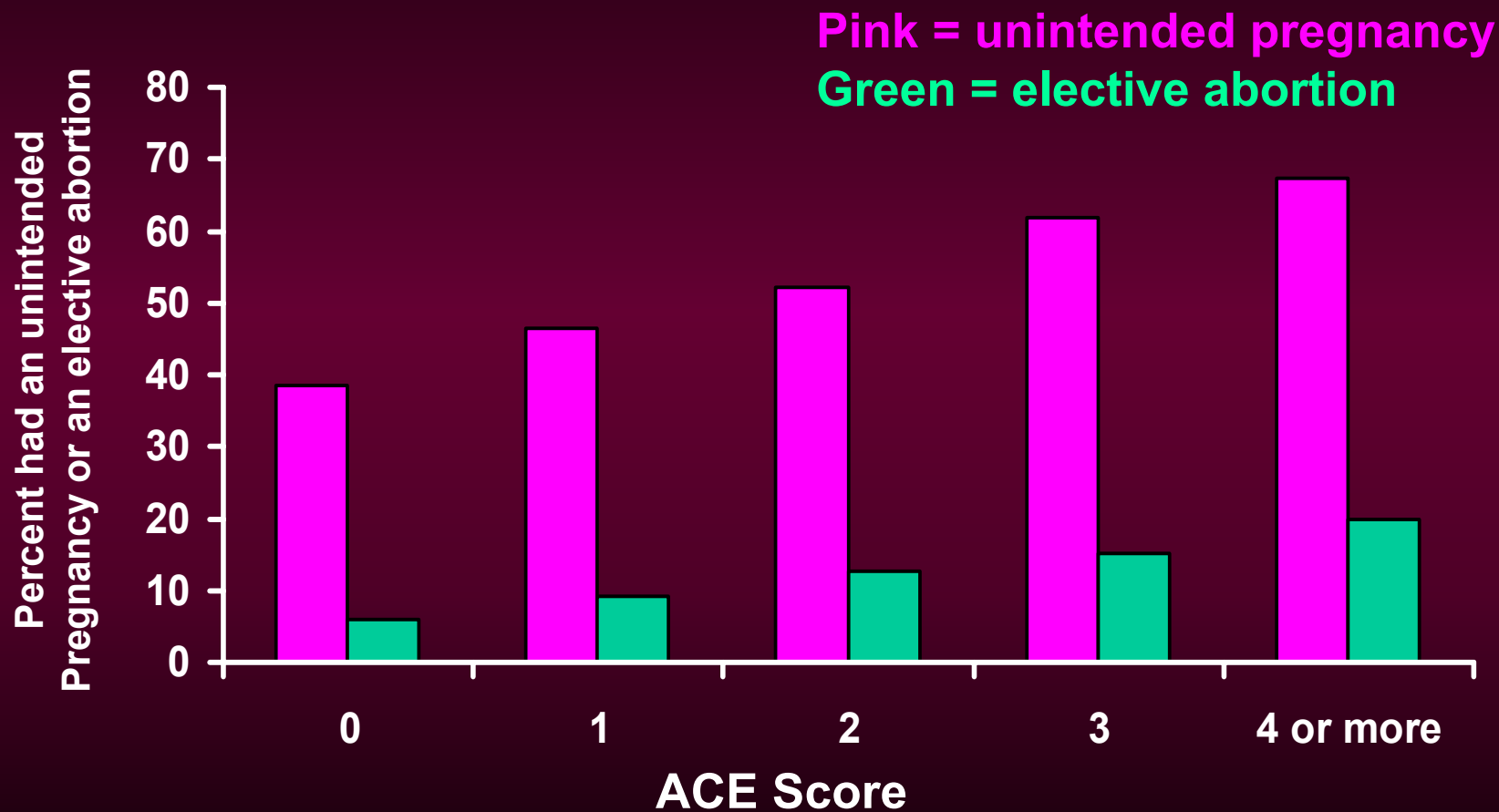


# ACE Score and Alcoholism, Suicide Attempts, or Sexual Assault

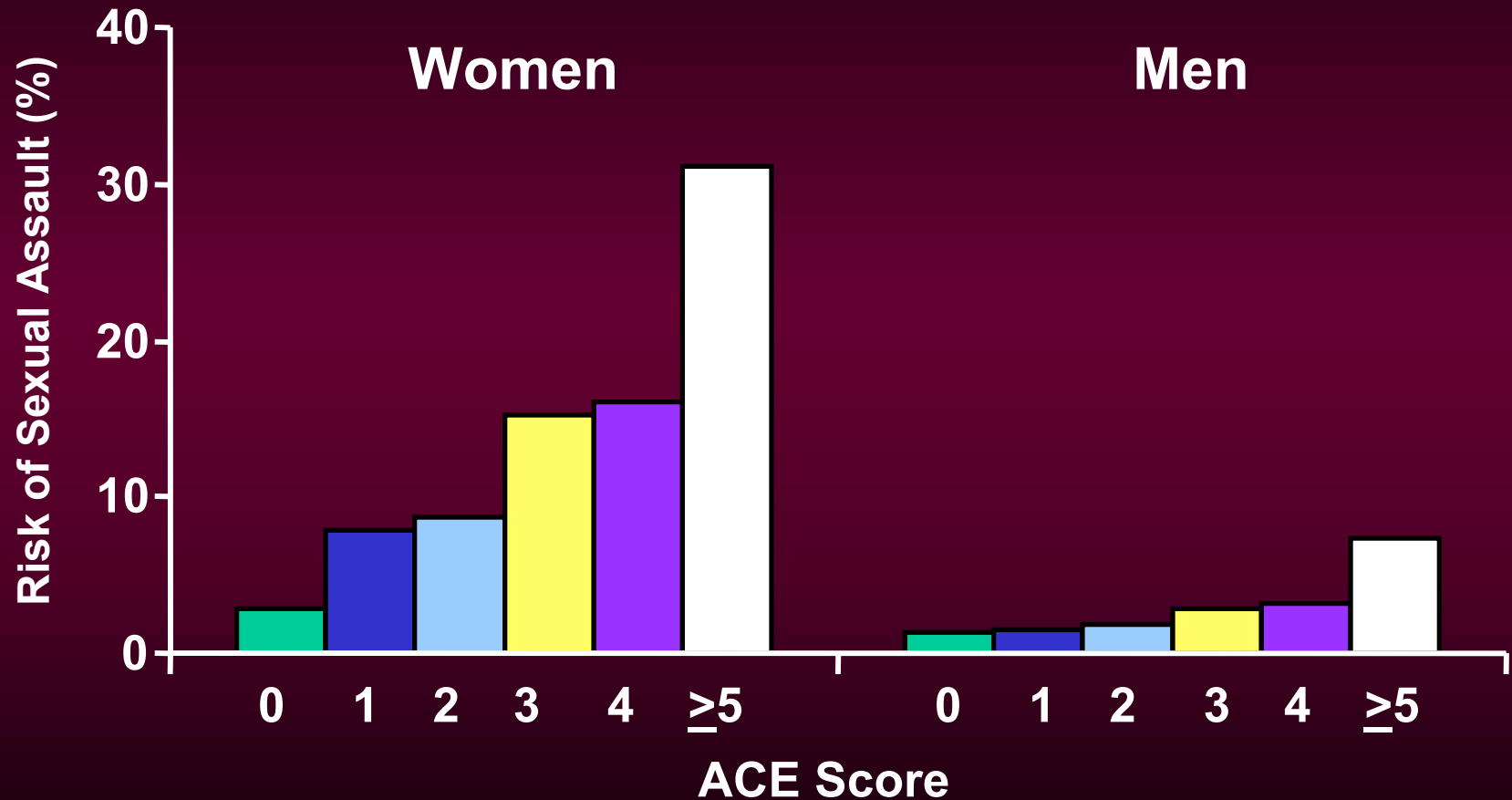




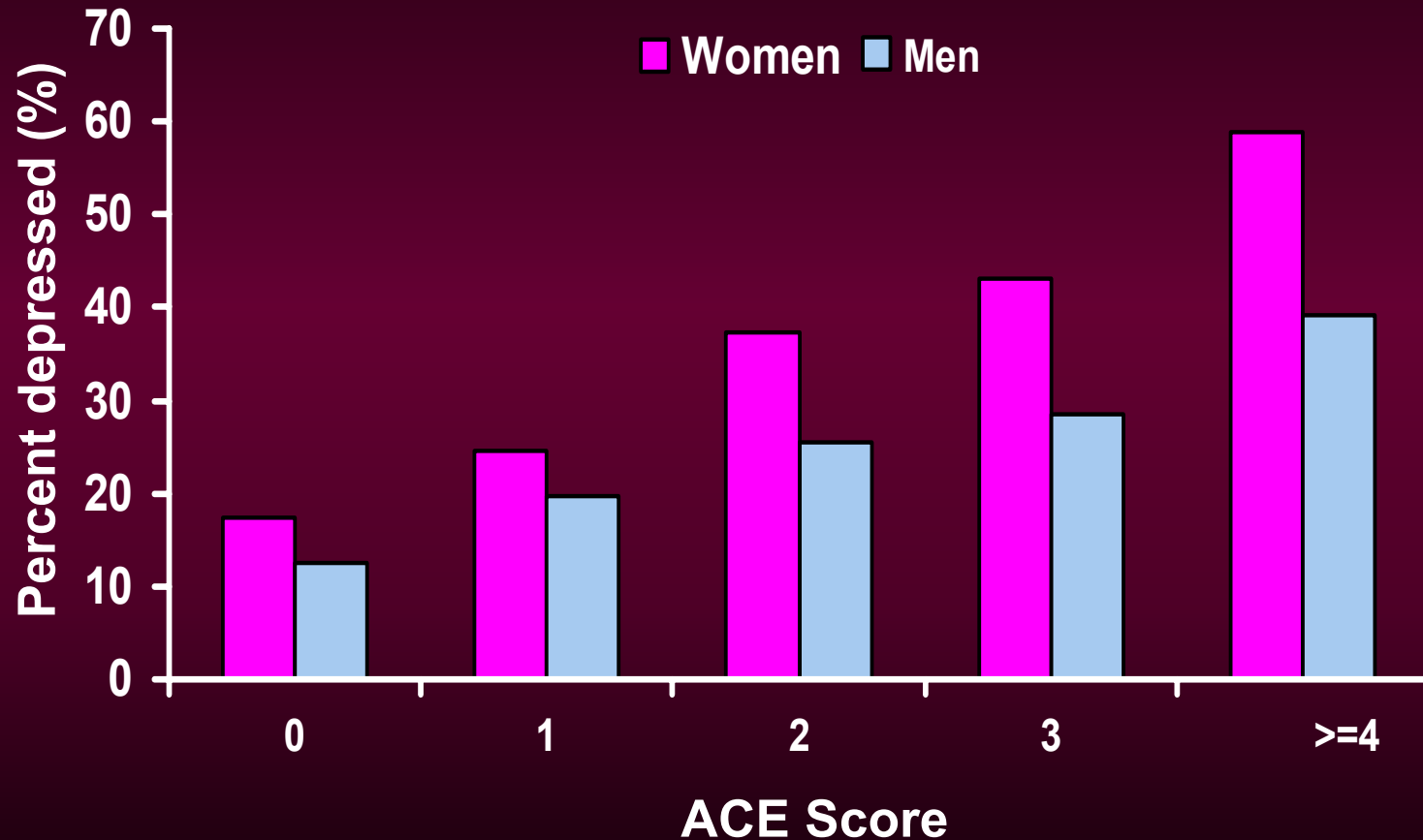
# Percent of Women Who Ever Had an Unintended Pregnancy or an Elective Abortion by ACE Score



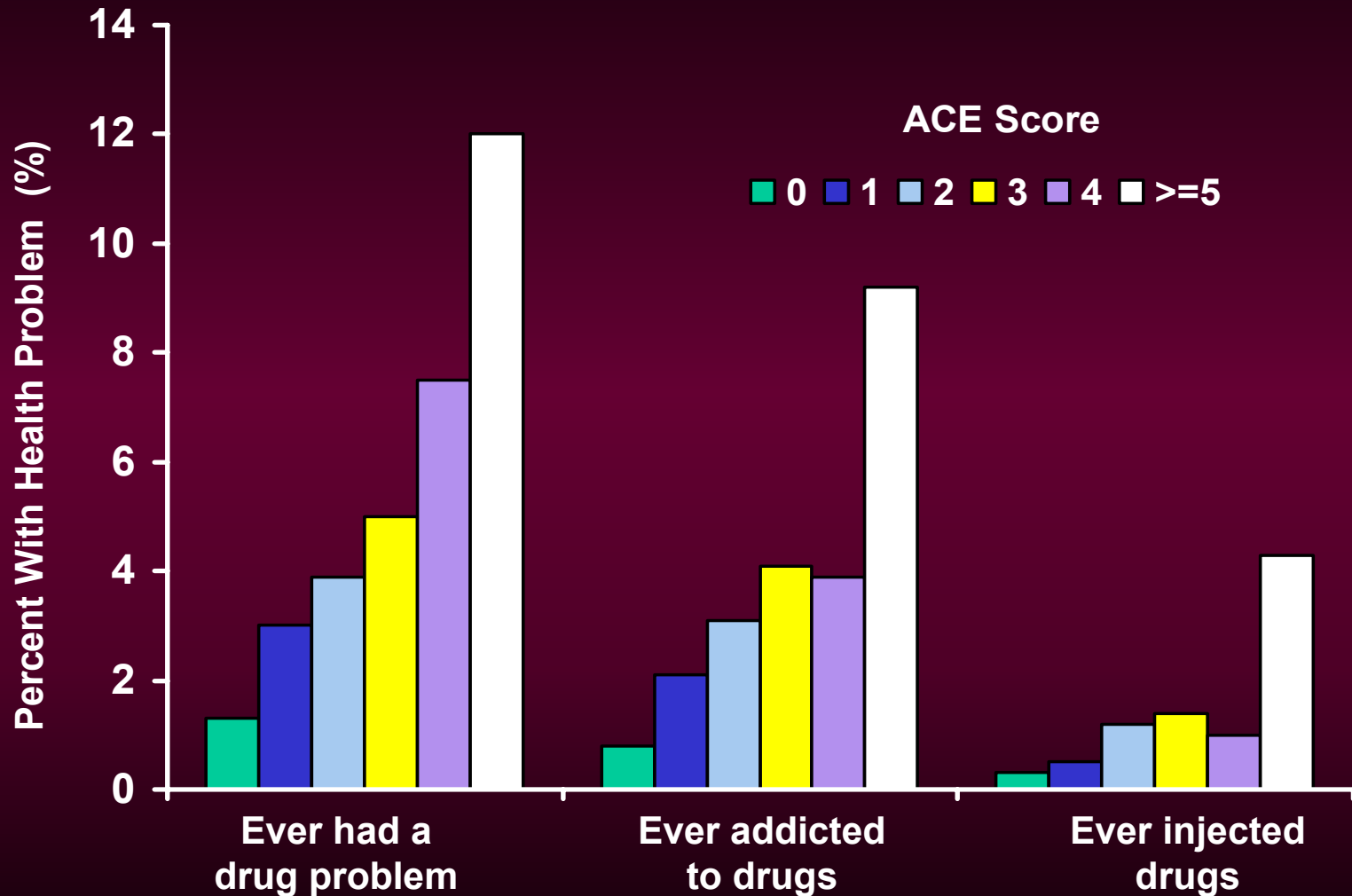
# ACE Score and the Risk of Being Sexually Assaulted as an Adult



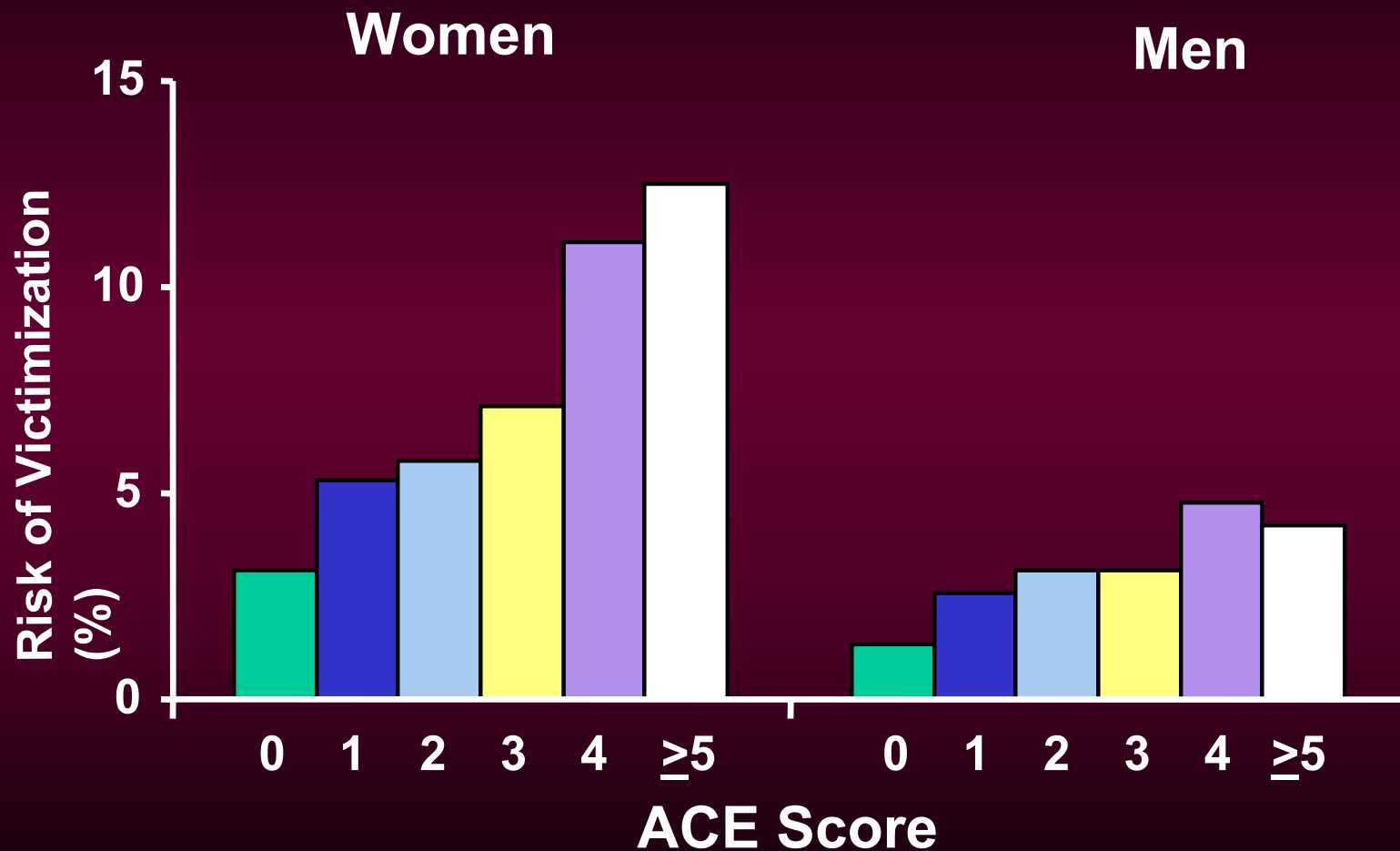
# Lifetime History of Depression by Number of Adverse Childhood Experiences and Sex



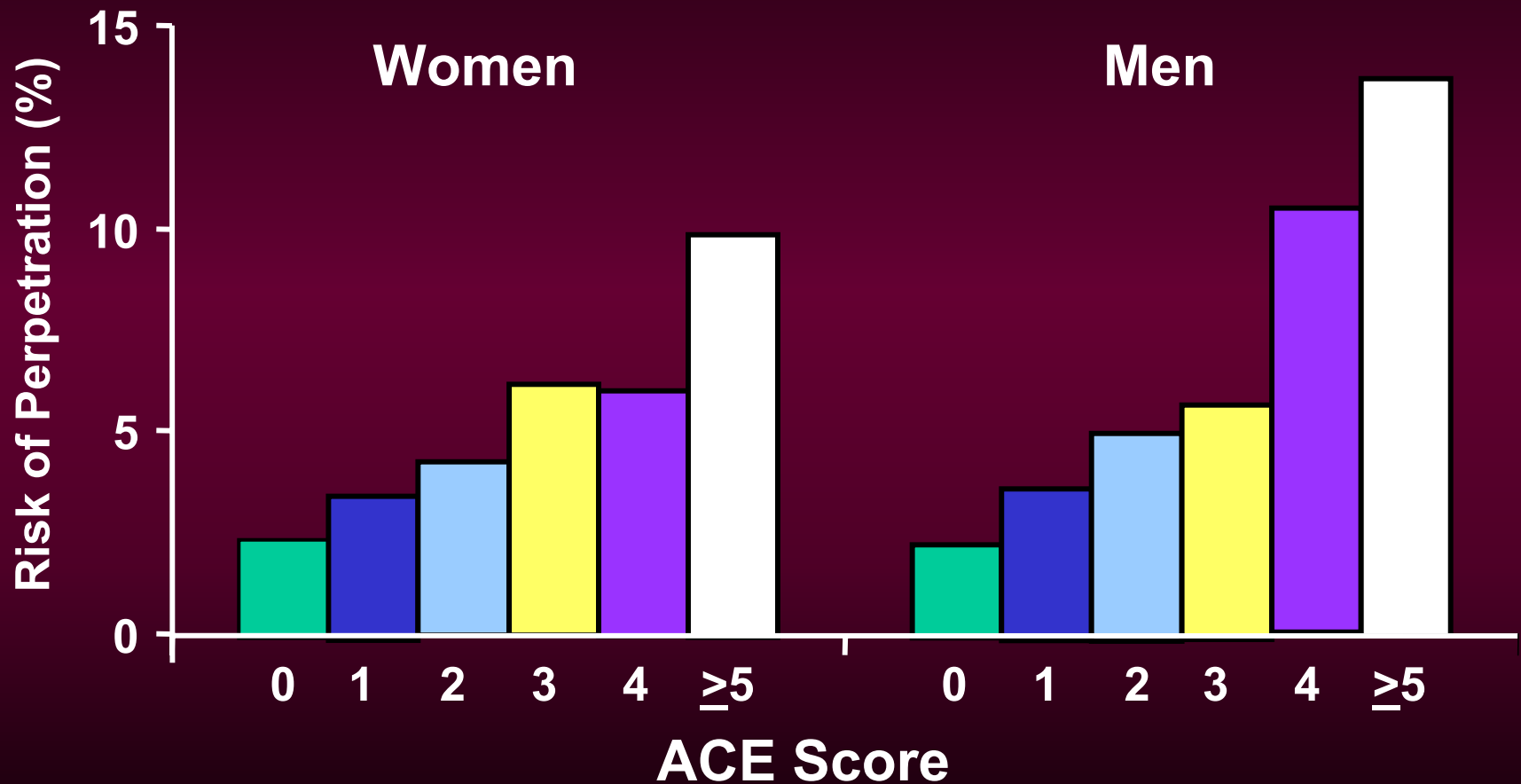
# ACE Score and Drug Abuse



# ACE Score and the Risk of Being a Victim of Domestic Violence



# ACE Score and the Risk of Perpetrating Domestic Violence

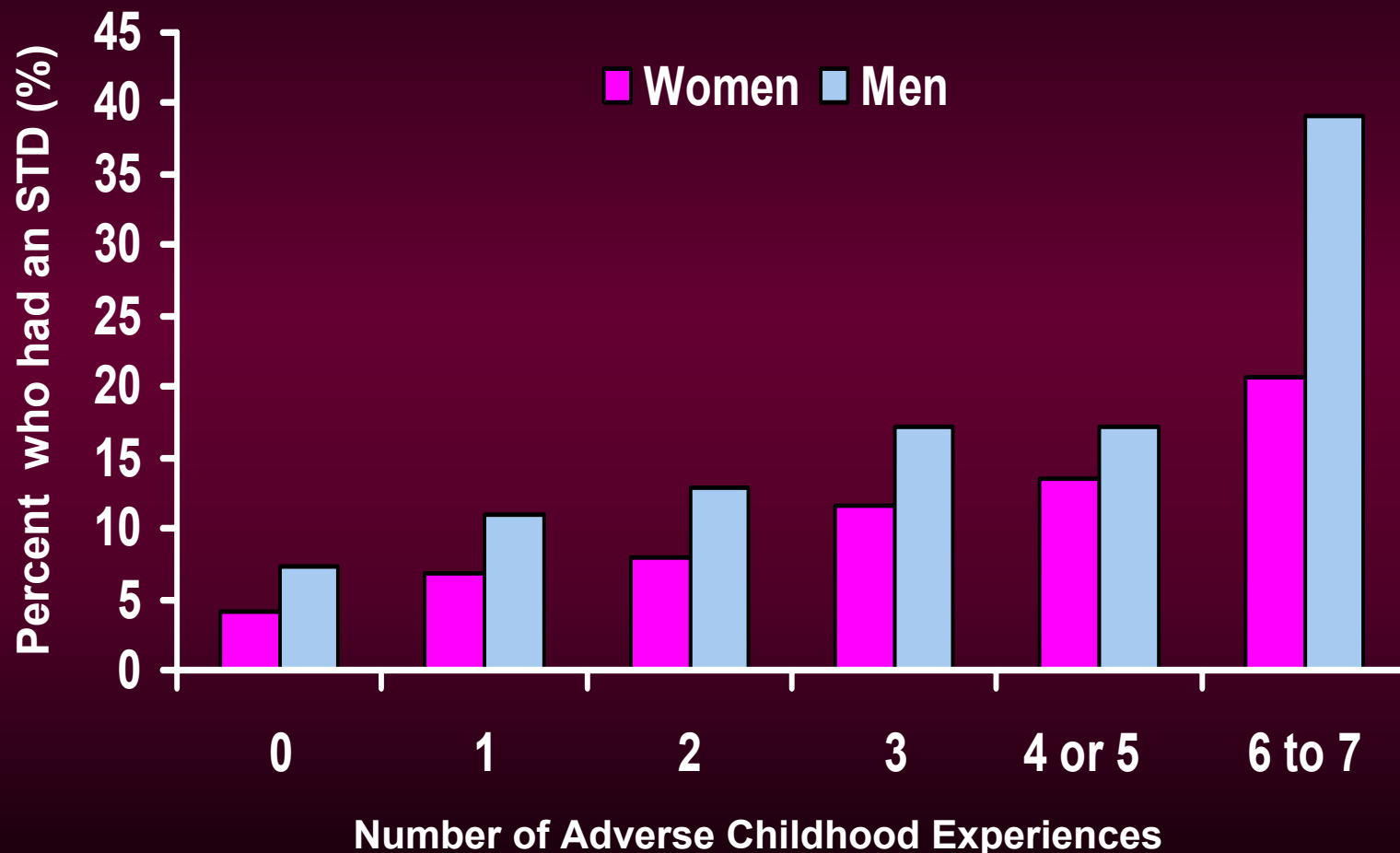




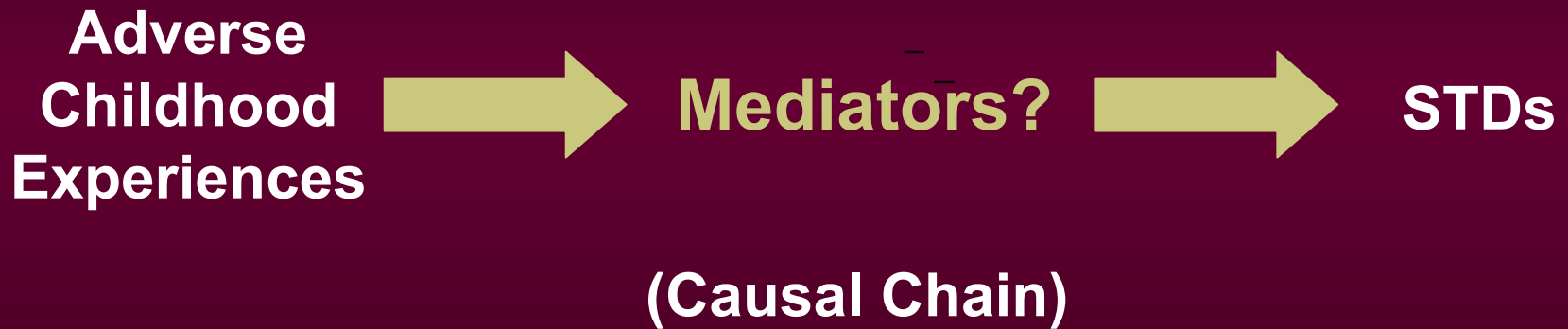
# **The Relationship of Adverse Childhood Experiences to:**

- **Sexual Behavior**
- **Risk of STDs**
- **Teen pregnancy and Teen Paternity**
- **Reproduction and the Cycle of Violence**
- **Unintended and Unwanted Pregnancies**

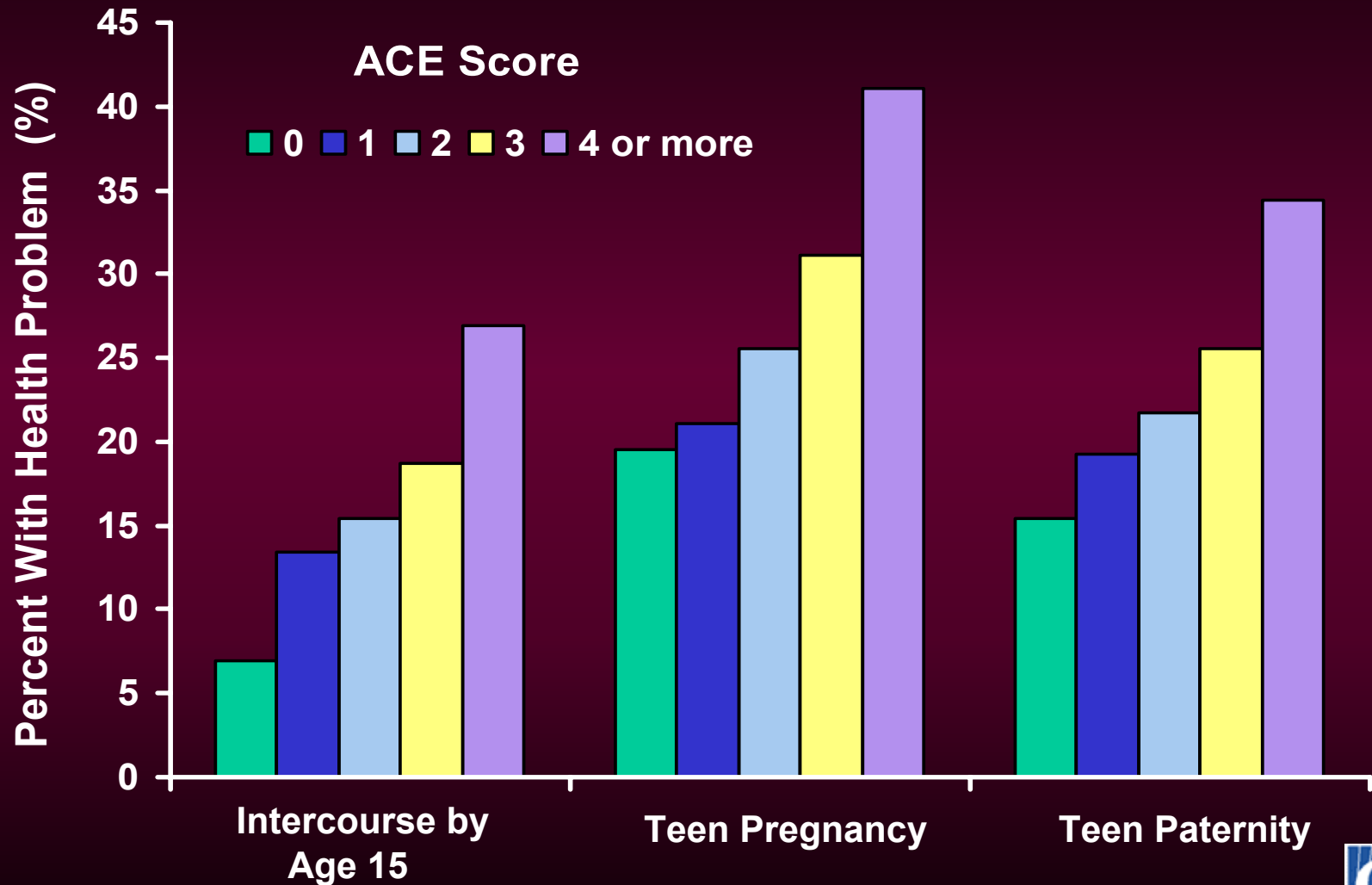
## Lifetime History of Sexually Transmitted Diseases by Number of Adverse Childhood Experiences and Sex



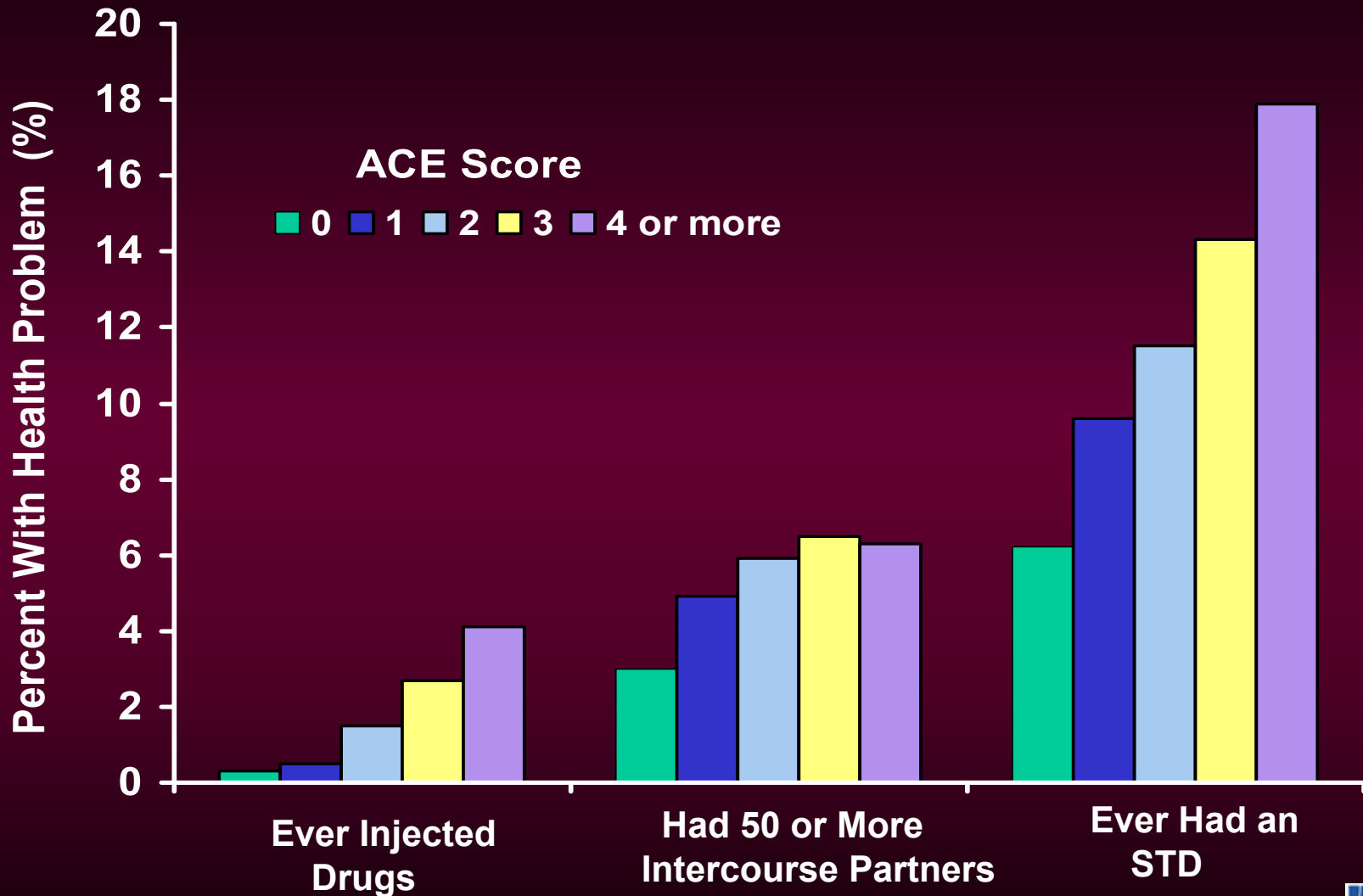
# How Are The Effects of ACEs On Sexually Transmitted Diseases (STDs) Mediated?



# ACE Score and Teen Sexual Behaviors

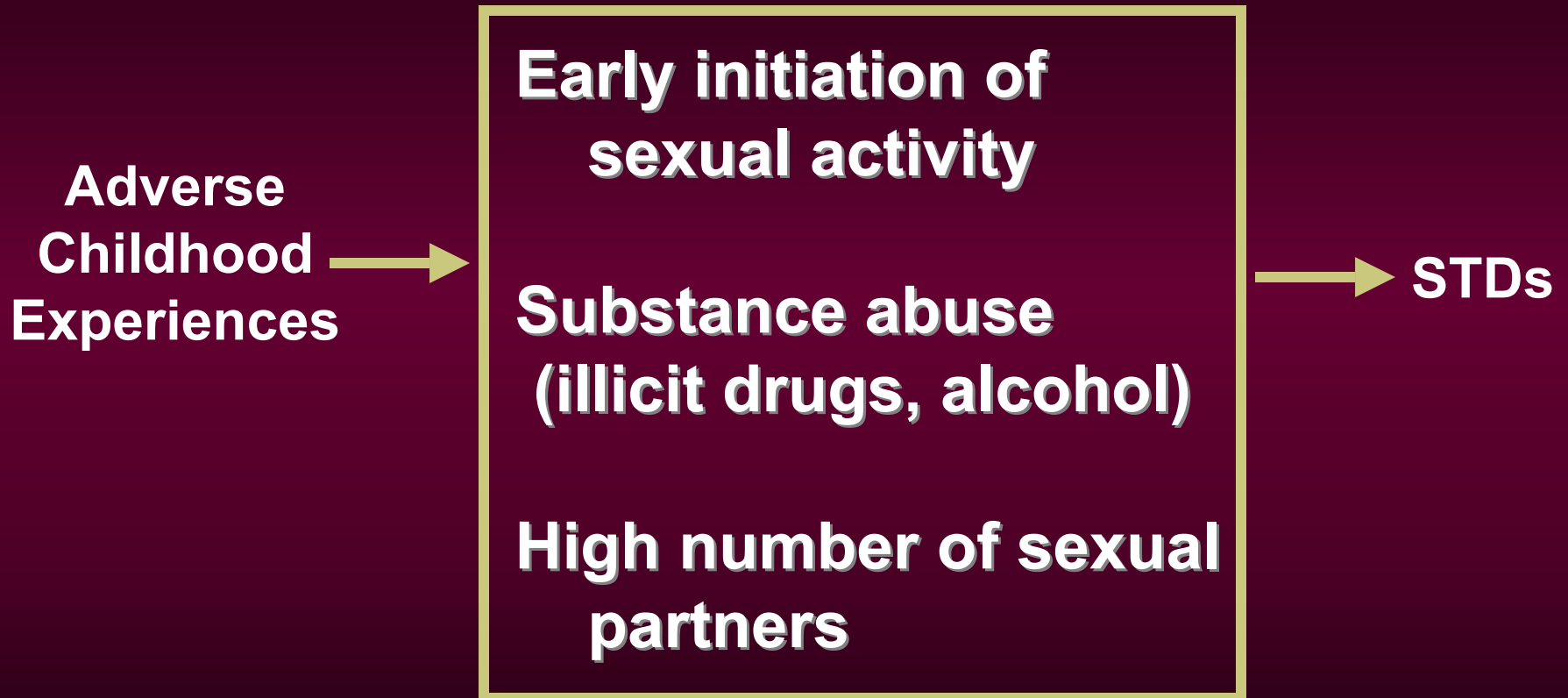


# ACE Score and HIV Risks



# **Behaviors by Which ACEs Lead to STDs**

## **-Mediators or Proposed Causal Chain-**





# **A Look at the Role of Domestic Violence Childhood Abuse, and Household Dysfunction on Reproductive Behavior**

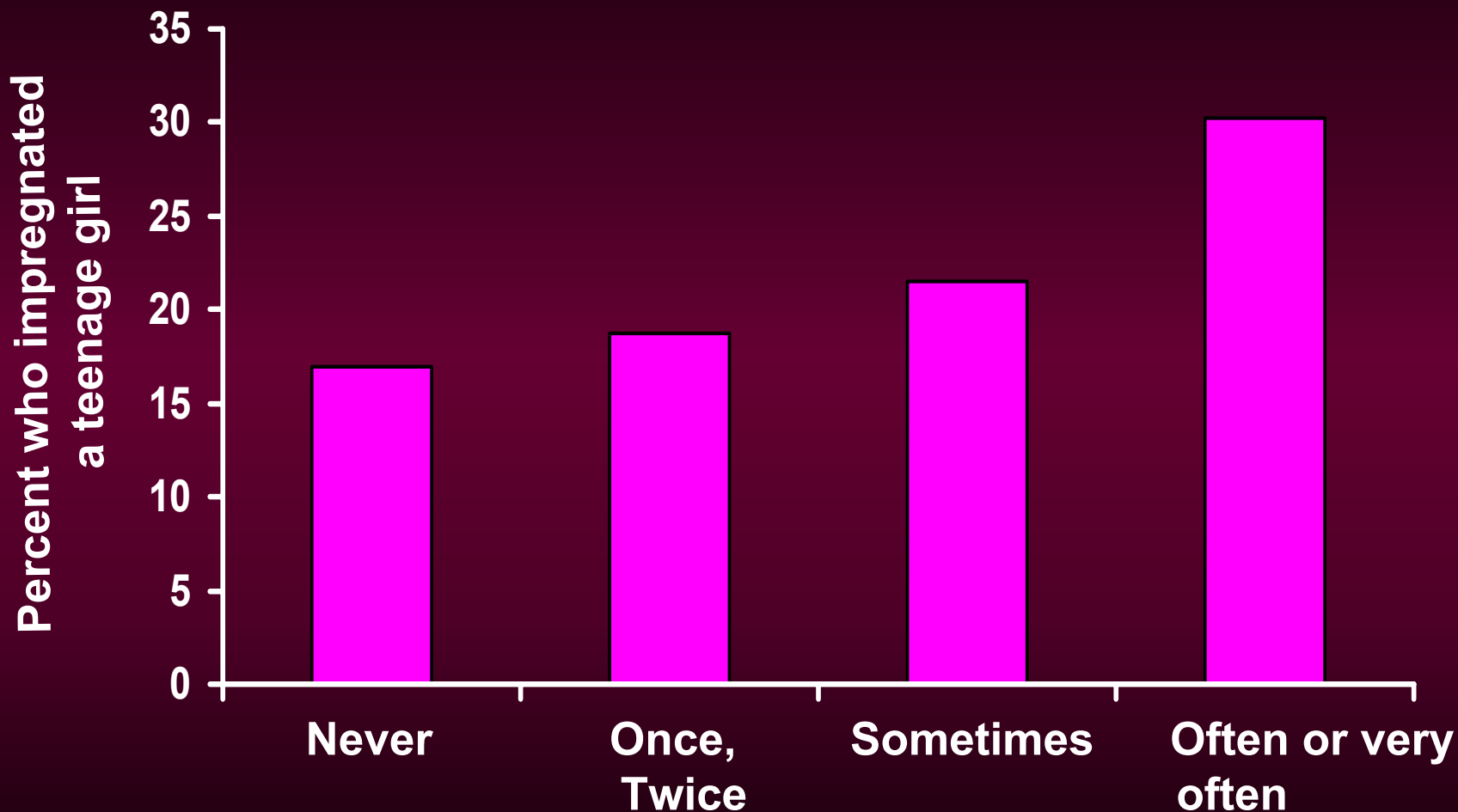
**or**

## **Is Domestic Violence Self-Replicating?**

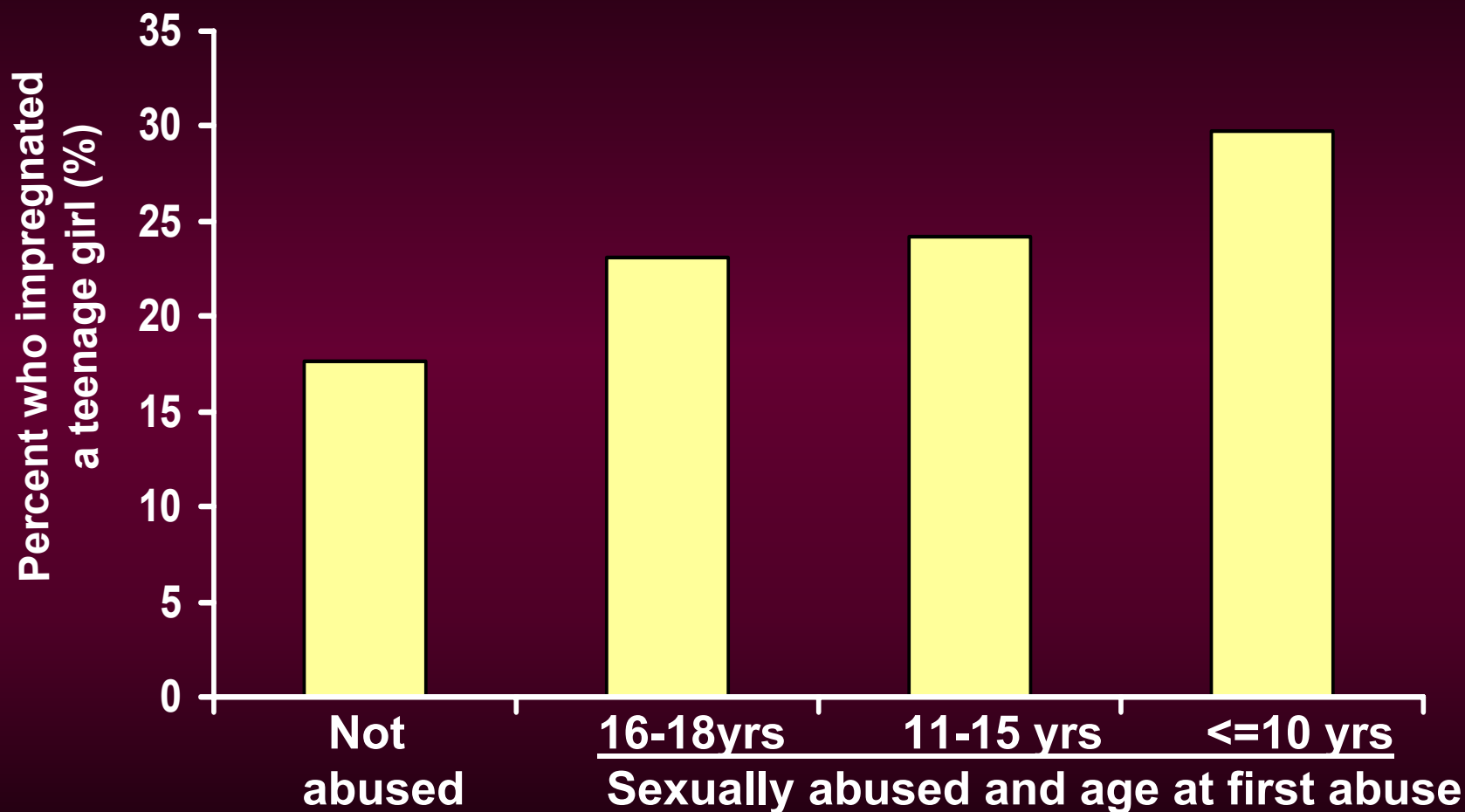
# Male Involvement in Teen Pregnancy

- 19% of men had impregnated a teenage girl
- the mean age of the males at the time of the impregnation was 20.7 years
- 60% of males were 20 years or older at the time of impregnation

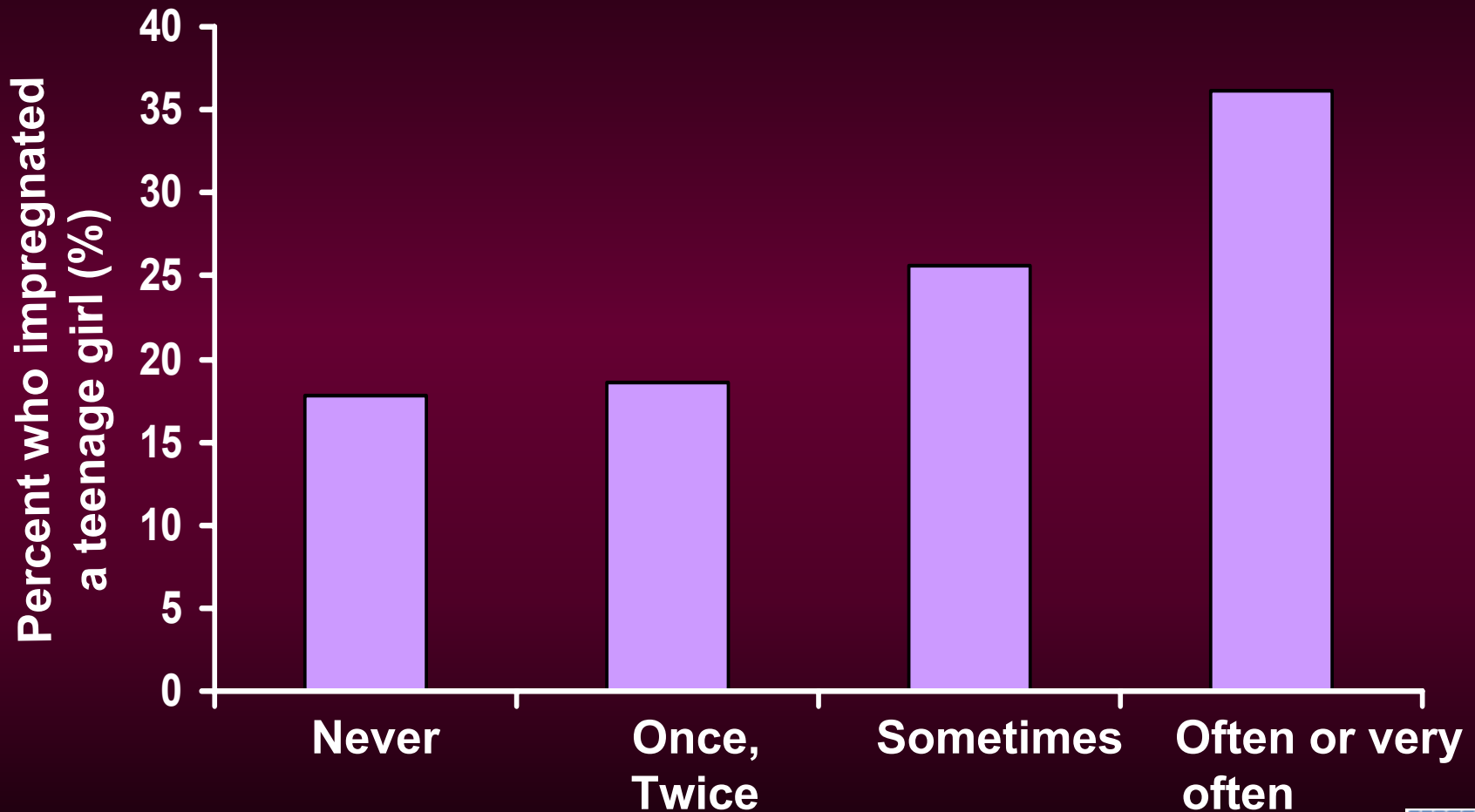
## Frequency of Being Pushed, Grabbed, Slapped, Shoved or Had Something Thrown at You as a Boy and the Likelihood of Impregnating a Teenage Girl



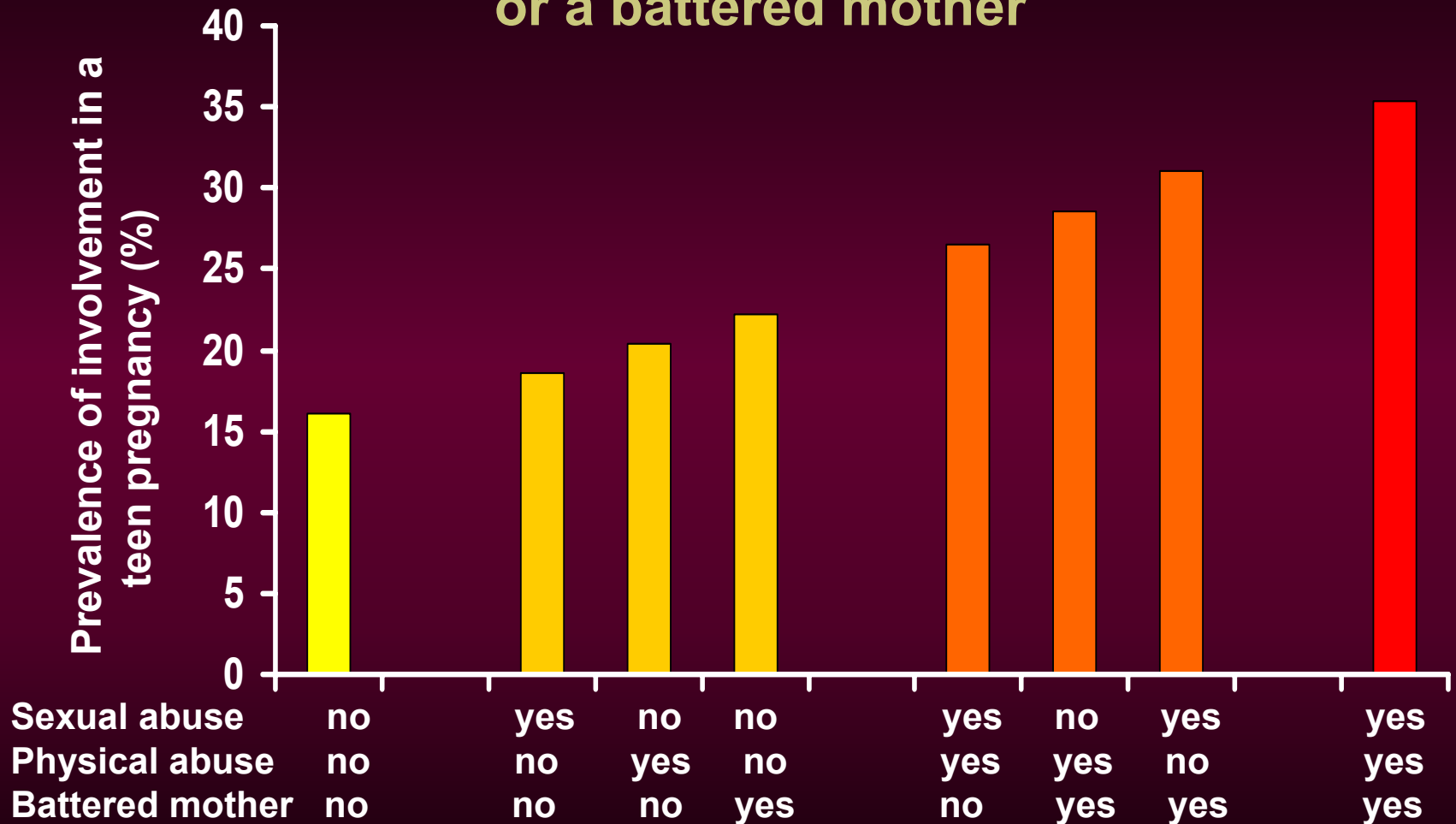
# History of Childhood Sexual Abuse and the Likelihood of Impregnating a Teenage Girl



## Frequency of One's Mother Being Pushed, Grabbed, Slapped, Shoved or Had Something Thrown at Her as a Boy and the Likelihood of Impregnating a Teenage Girl



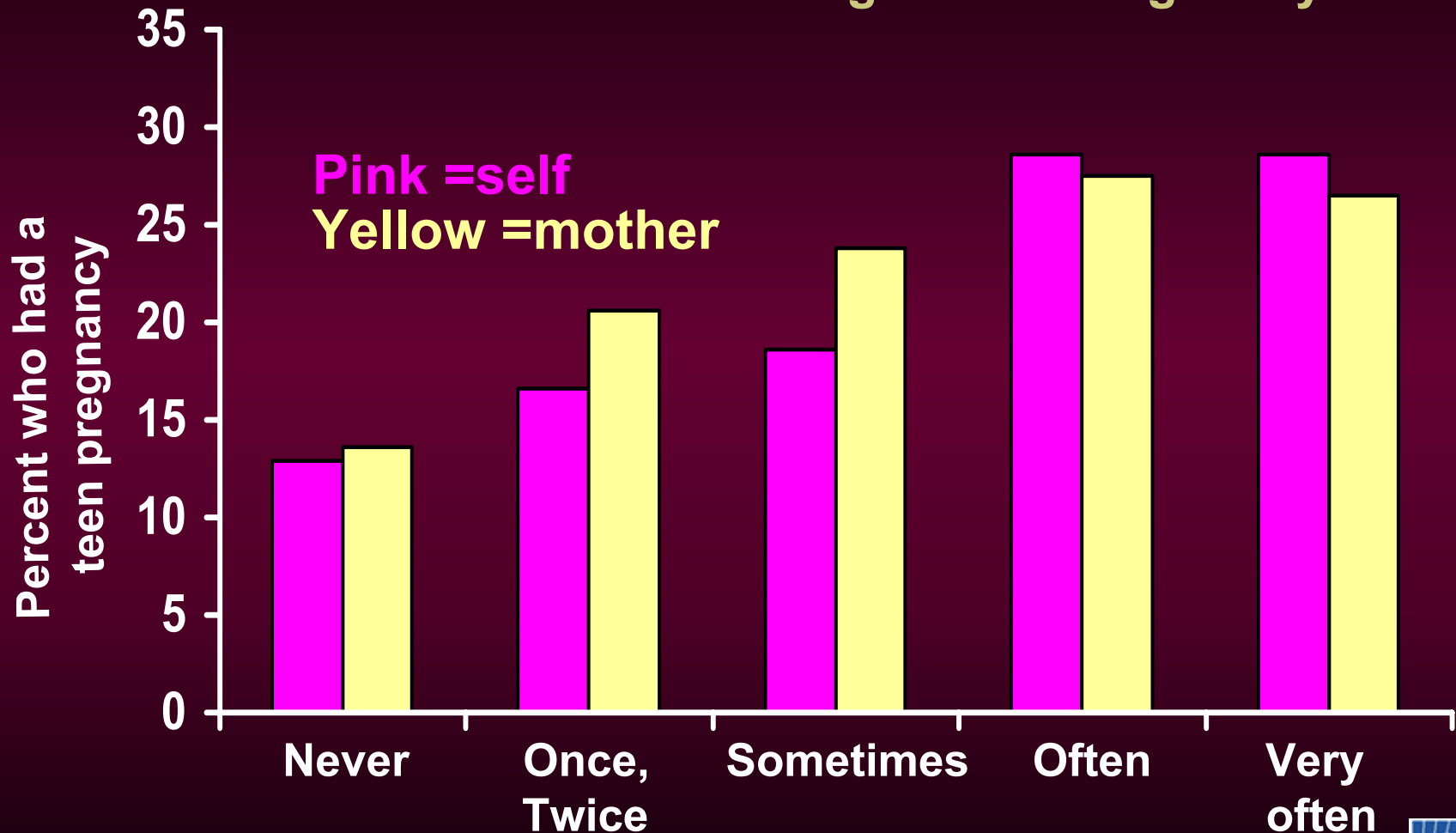
# Prevalence of involvement in a teen pregnancy by categories of exposure to physical or sexual abuse or a battered mother



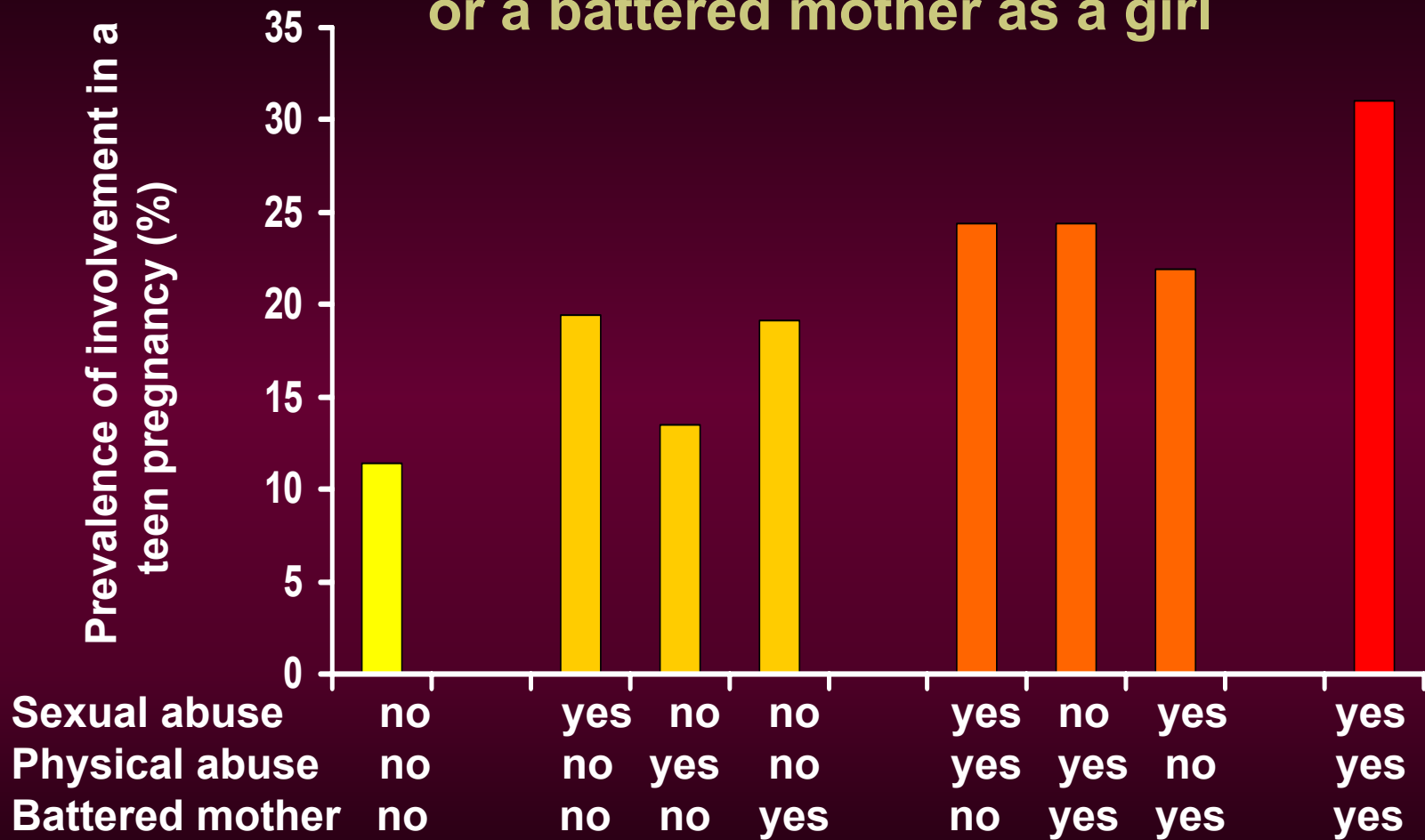
# **Childhood Abuse, Battered Mothers and Reproductive Histories Among Women**



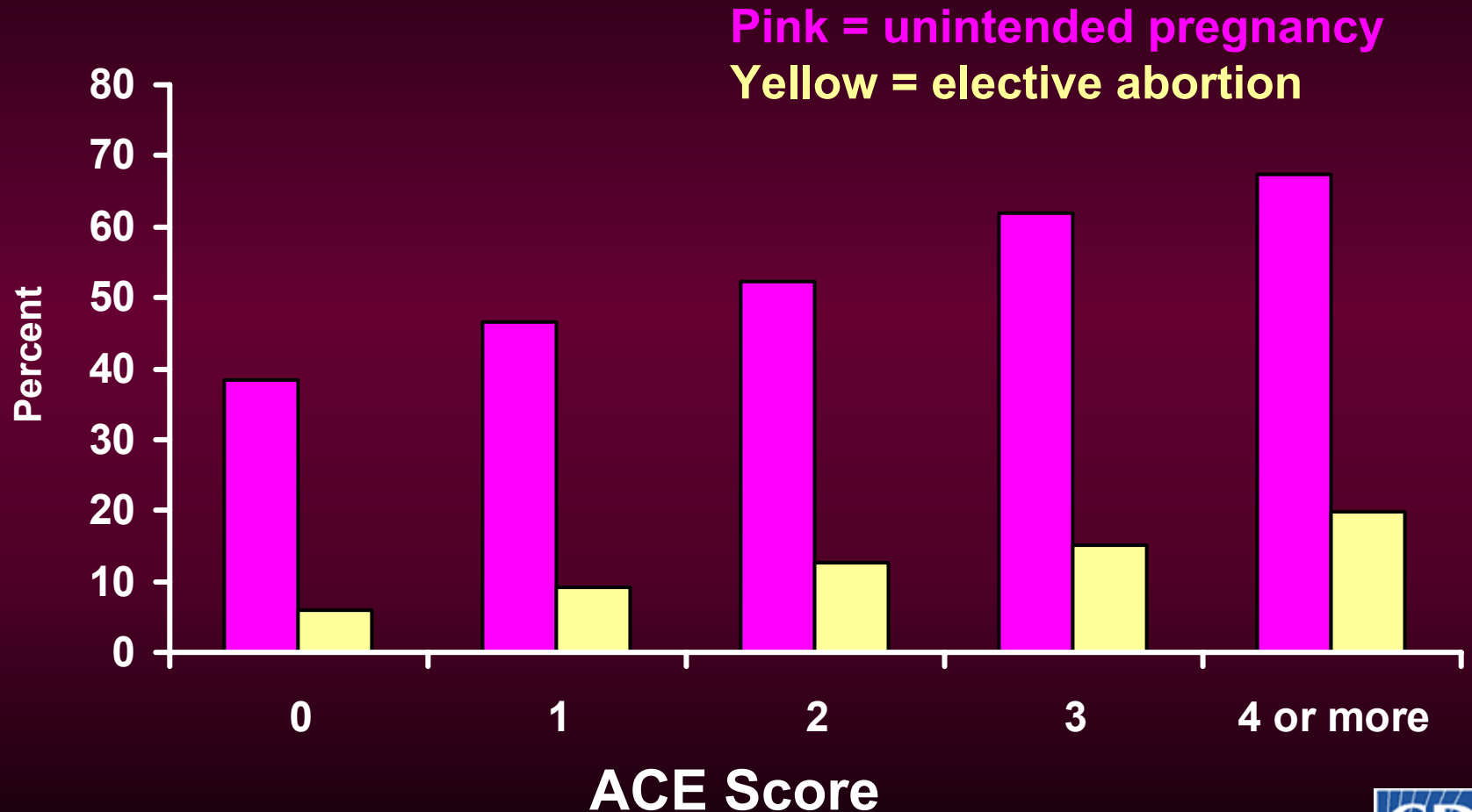
# Frequency of Being Pushed, Grabbed, Slapped, Shoved or Had Something Thrown at Oneself or One's Mother as a Girl and the Likelihood of Ever Having a Teen Pregnancy



# Prevalence of ever having a teen pregnancy by categories of exposure to physical or sexual abuse or a battered mother as a girl



# Percent of Women Who Ever Had an Unintended Pregnancy or an Elective Abortion by ACE Score



# **Adverse Childhood Experiences Lead to:**

- Earlier initiation of sexual activity**
- Higher numbers of sexual partners**
- Teen pregnancy and teen paternity**
- Sexually transmitted diseases**
- Unintended and unwanted pregnancies**

# Estimates of the Population Attributable Risk\* (PAR) of ACEs for Selected Outcomes in Women

<u>Mental Health:</u>	<u>PAR</u>
Current depression	54%
Depressed affect	41%
Suicide attempt	58%
<u>Drug Abuse:</u>	
Alcoholism	65%
Drug abuse	50%
IV drug abuse	78%
<u>Promiscuity</u>	48%
<u>Crime Victim:</u>	
Sexual assault	62%
Domestic violence	52%

\*Based upon the prevalence of one or more ACEs (62%) and the adjusted odds ratio  $\geq 1$  ACE.

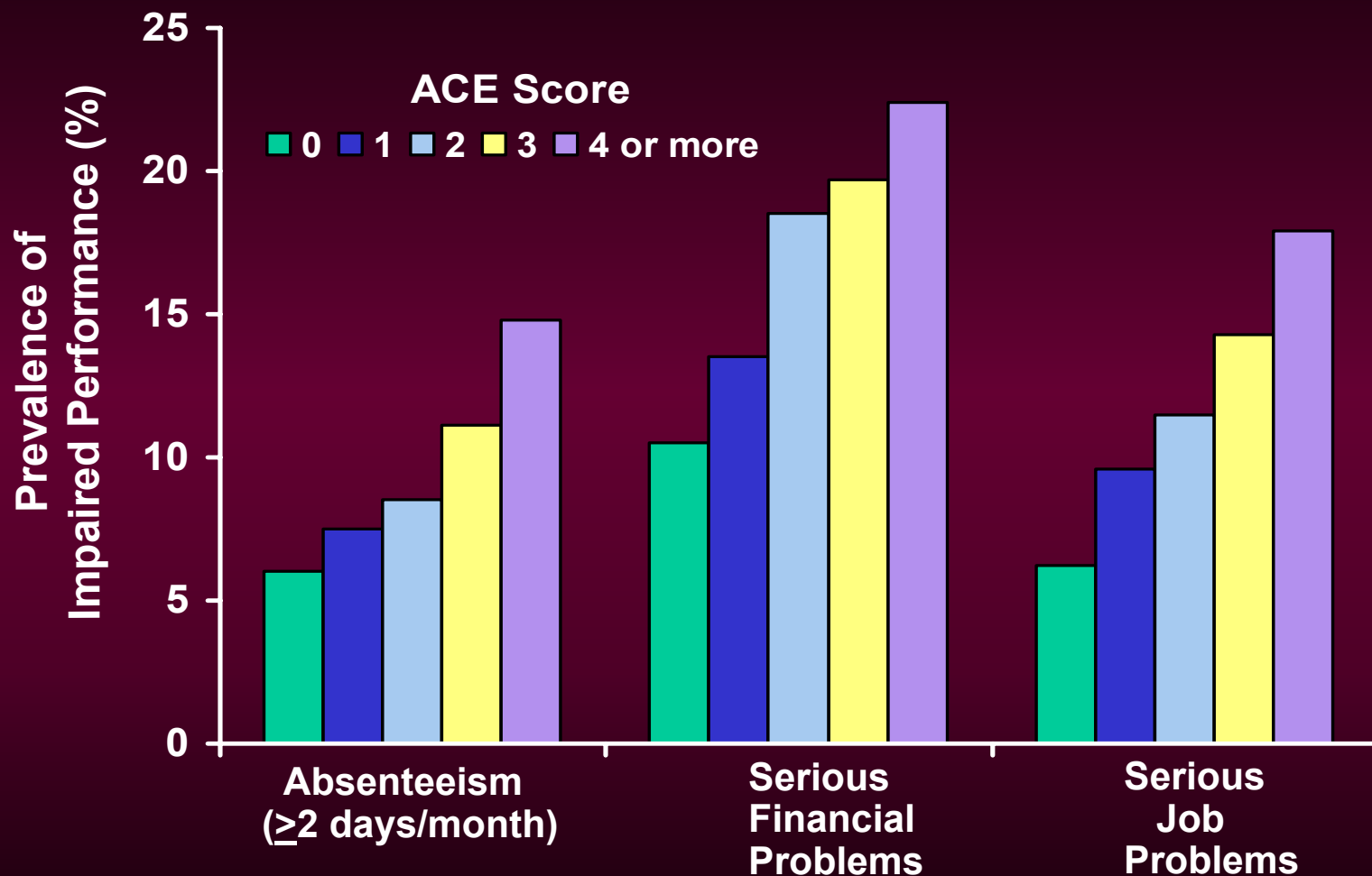
# How Do Adverse Childhood Experiences Affect Worker Performance Decades Later?

**Adverse  
Childhood  
Experiences**



**Poor  
Worker  
Performance**

# ACE Score and Indicators of Impaired Worker Performance



# How Do ACEs Lead to Poor Worker Performance?





## 4 Areas of Health and Well-Being as Mediators

**Adverse  
Childhood  
Experiences**



### **Relationship Problems**

- marital
- family
- sexual

### **Emotional Distress**

- depressed mood
- panic reactions
- difficulty with anger

### **Somatic Symptoms**

- back pain
- headaches
- joint problems

### **Substance Abuse**

- alcoholism
- smoking
- illicit drug use



**Poor  
Worker  
Performance**

# These Mediators Account for Most of the Effect of ACEs on Worker Performance

## **Indicators of Worker Performance**

---

## **% Mediation by 4 Areas of Health and Well-Being**

---

**Absenteeism**

**50-67%**

**Serious Financial Problems**

**50-83%**

**Serious Job Problems**

**79-100%**

# It's About Our Children

The major public health problems CDC (and other agencies) addresses have a common wellspring:

The routine exposure of our Nation's children to trauma/stressors during critical physical and developmental stages.

# Bridging The Chasm



Child  
health  
as it  
stands  
today

Breakthroughs  
in molecular genetics  
and biology:

Mental illness  
Substance abuse  
Violence

Improved recognition  
and treatment of:

Mental illness  
Substance abuse  
Domestic violence  
Child abuse

Mass education  
about child  
development &  
parenting:

Media  
Schools

Documenting the  
societal burden of  
child health as it  
stands today



New directions  
in prevention

Child  
health  
as it  
could  
be

# Bridging The Chasm



**Child  
health  
as it  
stands  
today**

**Involving those who don't yet realize that they are working on issues that represent the “downstream” wreckage of child abuse and neglect--and other adverse childhood experiences--in the effort to bridge the chasm.**

**Child  
health  
as it  
could  
be**

